

THE GEOGRAPHICAL MAGAZINE

VOLUME IV, NO. 4

ONE SHILLING MONTHLY

FEBRUARY 1937



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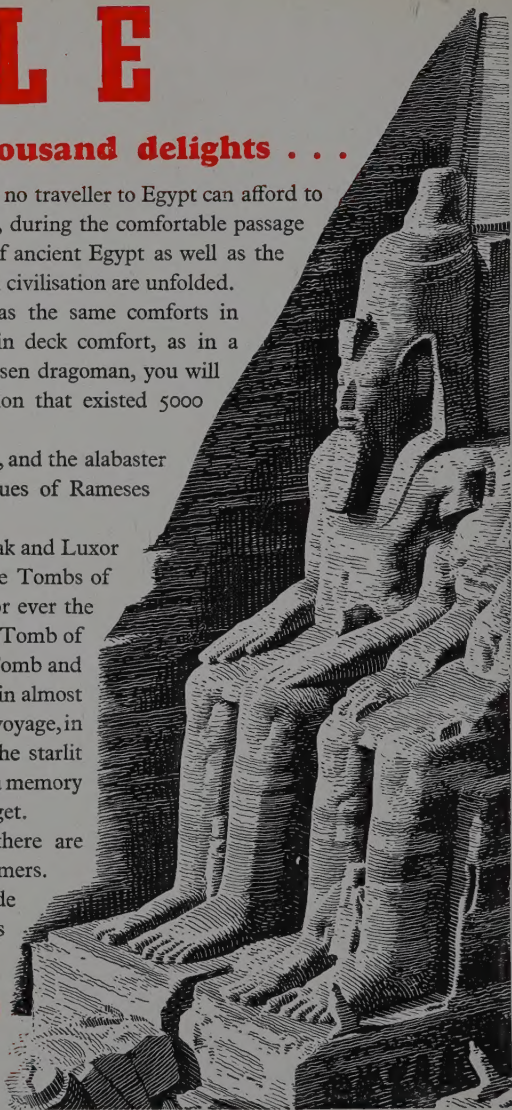
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Seamen of the Indian Ocean

by DENIS PALMER

Few Europeans realize, when they speak of 'the Moslem world', that it includes within its orbit most of the native maritime peoples of the Indian Ocean, from Tanganyika to the Malay Archipelago. Hence those commercial and family connections which, as Miss Freya Stark mentioned in our December number, unite places so far distant as the Hadhramaut and Singapore. Mr Palmer not only describes how these connections came to be established, but is able from personal experience to relate and compare the characteristics of the Moslem navigators in various parts of the Indian Ocean

FOR several thousand years now the picturesque slow-sailing dhows have been a familiar sight in the Indian Ocean. When the ancient Britons were launching their flimsy coracles, Phoenician ships of dhow design chartered by King Solomon were rounding Cape Guardafui. For centuries a large fleet of dhows from Cutch and the Persian Gulf has crossed on the wings of the north-east monsoon to trade with the peoples of the East African littoral. They bring with them Persian carpets, Arab chests, dates, spices and dried shark flesh, and, after disposing of this cargo and refitting and careening their craft, return with the south-west monsoon, mostly laden with grain.

Today this fleet, although of diminished size, still undertakes its yearly voyage across the seas. It carries almost the same cargoes; the character of its seamen remains unchanged and the design of its ships has hardly altered. What a fascinating study is this Indian Ocean with its living links with remote antiquity! And how few Europeans know anything of the history of its seafarers, or realise that by taking a trip in an Arab dhow they can obtain an insight into the lives of Eastern sailors of the age of Hiram.

The first time that I saw an Arab dhow stealing out of Mombasa harbour in the red glow of early morning, my imagination was fired. I watched her Arab and Swahili sailors dip their crudely-carven oars into the water until, passing Fort Jesus (built by the Portuguese), they felt the first ocean air-currents, and hoisted the

tattered three-cornered sail. Then, like a gigantic sea-bird, the dhow skimmed away, dipping her nose in the mirror-like sea, flinging up millions of glittering diamonds.

Since that day I have undertaken many voyages in these primitive ships and learned to appreciate the capabilities of their sturdy sailors. Before describing some of my experiences while living aboard Arab dhows and other native craft, I will first swiftly survey the varied fleets and nationalities that have made the routes across the Indian Ocean their highway.

Although the Egyptians never maintained a permanent fleet in the Red Sea, they repeatedly tried at different periods to bring themselves into contact with southern Arabia and the eastern horn of Somaliland, the countries that produced the spices they used so much and valued so highly. Seanchkara, the last king of the eleventh dynasty, commissioned Henu to fit out an expedition from Coptos to 'Punt'. A similar task was entrusted to the fleet of Queen Halkephut about 1490 B.C. The Egyptians must certainly be regarded as the earliest recorded navigators of the Indian Ocean.

India with her enormous wealth was always an irresistible magnet luring the Near Eastern races and later the Europeans to brave those then uncharted wastes. The first attempts at direct maritime communication with India from the west were undoubtedly made by the Phoenicians, whose trading ventures to the north-west Indian Ocean date back to the 2nd

millennium B.C. Even at the time when Hiram and Solomon sent to Ophir from Elath, the route to that mysterious district of gold had long been known and used.

From the reign of King David the Hebrews, in spite of the fact that they were not a maritime race, recognized the inestimable value of easy access to the Indian Ocean, and the defence of Edom, with its port of Elath in the Gulf of Akaba, was always one of the most important functions of the princes of Judah. After 730 B.C., the Hebrews can no longer be reckoned a naval power and their fleets finally disappeared altogether.

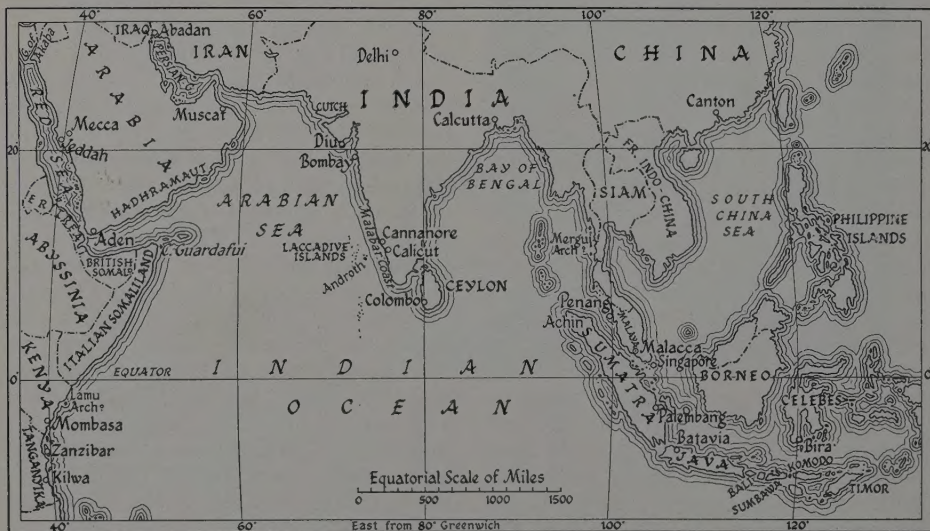
The Phoenicians, unlike the Hebrews, did not covet political greatness but only desired to be left alone to trade; they became past masters in the art of attaining their goal not by opposing the enemy but by utilizing him. They used both the Hebrews and the Egyptians to further their trading expeditions, the wide range of which—from Britain to Ceylon—testifies to the skill and boldness of their navigators.

Up to this time the trading had mainly been coastal, cargo being carried only for a limited distance by the sailors of each

region, and then picked up by someone else. No one nation had as yet organized maritime communications direct across the whole ocean.

After the conquests of Alexander, however, when India became widely known to the West, communications were carried on for over a thousand years direct between that country and Alexandria. In 30 B.C., when Egypt was proclaimed a Roman province, a further stage in the organization of commerce with India was reached. The way thither now lay open to an exceptionally enterprising power and instead of indulging in erratic expeditions the Romans began to make use of the monsoons.

The discovery of this phenomenon, the secret of which had long been closely guarded by the East, was made in about the middle of the 1st century A.D., supposedly by the Greek navigator Hippalus. This knowledge, although it made possible real voyaging across the Indian Ocean, forced those who used it to adopt a regulated system of trading. It meant that their fleets had to arrive and depart with the changing monsoons at roughly the same time each year. The Romans sent





W. H. Stevens

Dhows 'stealing out of Mombasa harbour in the early morning'. The two on the left are of the M'tepe type (see page 241): that on the right hails from the Persian Gulf

ships to Ceylon, Malacca and China, most likely to Canton.

After A.D. 250, Roman vessels ceased appearing in Chinese waters and the Chinese, afraid of losing their valuable trade connections with the West, started sending their own junks for longer distances. In the 4th century A.D., they were in Penang, reaching Ceylon towards the end of that century and, later, the Persian Gulf and various East African ports. Part of this trade was shared with the Chinese by the Malays. From the 4th century on, the Græco-Roman seamen were slowly ousted by races which, although long settled on the borders of the Indian Ocean, had only just learned to make use of it.

Indians, Arabs and Persians all started sending ships across to East Africa, but for a long while the Persians had by far the greatest proportion of this trade, and easily gained complete monopoly of the short

route across the mouth of the Persian Gulf. These three races also sent their vessels to Colombo where they received the wares brought by the Chinese junks: silk, aloes and sandalwood.

A new force was now coming into power which eventually affected every country whose shores are washed by the Indian Ocean. A few years after the death of Mohammed in A.D. 632 his flag and faith were borne to the Mediterranean and as far east as the Pacific. By contrast with the well-known historical events which marked the militant advance of Islam westwards, there is little record of its progress eastwards along the coasts of the Indian Ocean. The process seems, in the main, to have been one of peaceful infiltration: certainly Arab sailors and merchants first introduced it to Achin and Palembang in Sumatra and, much later, to Java. There is no evidence to suggest that they



founded colonies, but undoubtedly many individual Arabs from Mecca, Muscat and the Hadhramaut were very early established in the principal ports of the East Indian archipelago where they exercised considerable influence on the destinies of the natives.

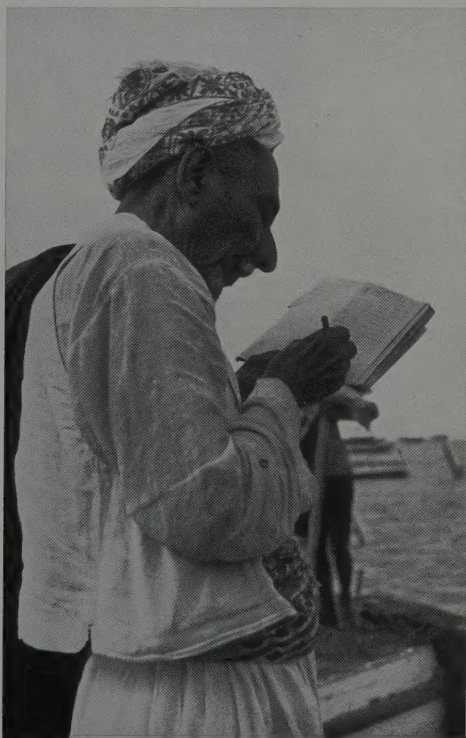
Wherever the Arabs penetrated, in fact, they converted the original inhabitants to the True Faith and effected remarkable changes in their customs, life and thought. They often intermarried with the natives, producing in time a new race. Such are the Swahilis of Zanzibar and Kenya and the Moplahs of the Malabar Coast of India. By the middle of the 8th century the Arabs had sailed round the coasts of India to Malaya, Java, Siam and China. Until nearly the end of the 15th century, they remained undisputed masters of the sea trade with the East, establishing trading centres wherever they touched.

The next great transformation was when Vasco da Gama in 1498 made his famous voyage to Calicut, which eventually gave the Portuguese practical control over the whole Indian Ocean. For more than a century they were supreme, till the year 1650, when the Dutch overcame them on sea, and on land the coastal tribes of south-eastern Arabia drove them out of Muscat. The Arabs then began to assemble a great fleet at Muscat, composed largely of square-rigged ships of European design. With these they harried the Persian shores and after an interval of twenty years sailed across the Arabian Sea and sacked the Portuguese town of Diu. By 1700 the Arabs were as free of the Indian Ocean as the Portuguese had been in 1600, and not until the 19th century, when Great Britain put a stop to the slave trade, was there any interference with the Arab seamen.

Today, when the *Pax Britannica* has long prevailed over the seas and coasts which they frequent, the Arabs peaceably carry on their trading ventures by dhow as of ancient time. All countries bordering the Indian Ocean are familiar with their lateen-

sailed craft, and the coast dwellers of these lands include a large proportion of Mohammedans. Thus the Indian Ocean is surrounded by a vast, unorganized but extremely potent Moslem culture.

Right round the Arabian peninsula from Akaba and Jeddah on the west, past Aden and Muscat to Abadan and Basra at the head of the Persian Gulf, and all down the north-west coast of India, the Arab dhows ply their busy commerce. They intrude into tiny East African ports everywhere from the Red Sea past Cape Guardafui in the north to Kilwa in southern Tanganyika. You see them in Malayan harbours and in the Dutch East Indies. Their historic trading takes them up creeks and inlets where no steam vessel



Oscar Marcus
A dhow-owner of Jeddah keeps his tally: dates, carpets, dried fish, perhaps, to be exchanged for grain at Mombasa and cloves at Zanzibar



T. Hickinbotham

W. H. Stevens

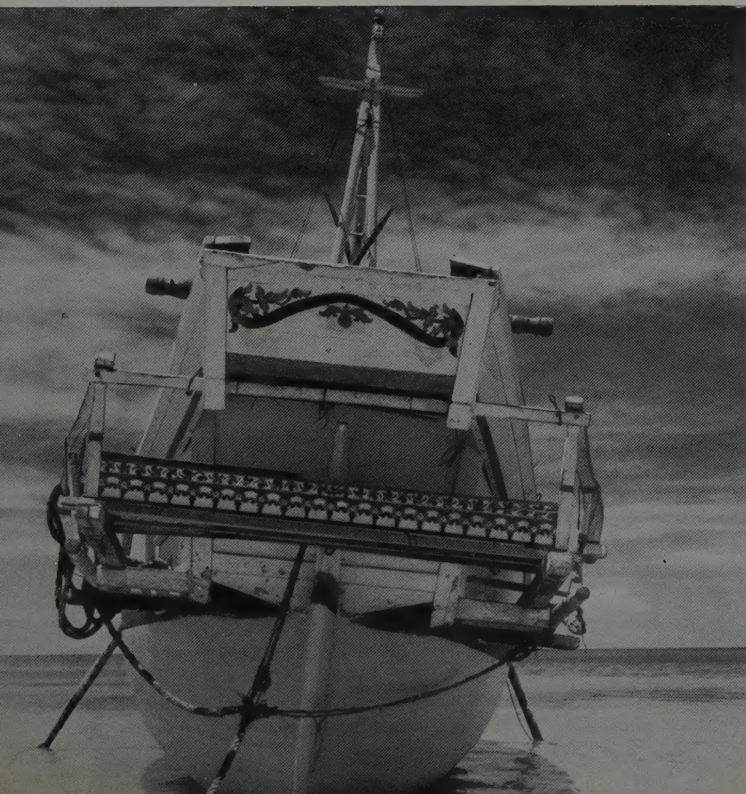
The true Arab sea-going dhow is a fast, able ship, of as much as 200 or even 300 tons' burden. Though there are local differences of detail, these vessels vary little as a class: great beam and a decorated poop are among their chief external characteristics. (Above) A dhow built at Makalla in the Hadhramaut; (right) another from the Persian Gulf, at Mombasa, with stern windows reminiscent of a long-vanished European style





E. P. Collins

P. J. van Baaren



The corresponding vessels of the Malay archipelago go by the generic name of prahus. A deep-sea merchantman in Old Batavia harbour (above) carries on her starboard bow a modern iron anchor, and on her port bow an old wooden grapnel. At Bira in Celebes may be seen (left) a design partly copied from Portuguese ships 400 years ago. Note the steering gallery: the two rudders are lashed to heavy beams on each quarter



Denis Palmer

On a dhow bound for Lamu. The sailors of the East African coast are mainly Swahili, of mixed Arab and African descent

can go, or would consider it worth while to go, ferreting what cargo they can. A rough estimate of the quantity of cargo still being carried by dhow can be obtained from the fact that on an average the ports of Kenya alone record over 7000 dhow entrances and departures per annum.

My first voyage was from Mombasa to the Lamu Archipelago, one hundred and thirty miles farther north. Abdul Salim, an Arab wood-seller, kindly introduced me to a dhow captain, a typical dark-bearded Arab seaman with courteous manners and a remarkable knowledge of the sea inherited from generations of sailor ancestors. His dhow, the *Faza*, owned by an Indian, was typical of hundreds of other coasting craft. The single mast was raked sternwards to facilitate going about when the long slender lateen sail has to be lowered

and passed round it, again to be hoisted as the vessel turns off on the new tack.

The freeboard was so low that I feared the slightest sea would swamp us, but to counteract this defect woven coir matting about eighteen inches high was fixed right round the sides from stem to stern. This coir bulwark is never put up till after the loading is finished, and although it prevents spray from continually soaking cargo and crew, is not of much value in really dirty weather.

On boarding the *Faza* I noticed that it had been heavily overladen and remembered that this was one of the reasons why Europeans are not keen on sending goods by dhow. For it is a common occurrence for portions of their cargo to be washed overboard. Sacks of rice and bales of matting were piled haphazardly one upon the

other; sacks of grain, mangrove poles, cotton piece-goods and dried fish were all carelessly mixed together. There was no accommodation for the crew or passengers and we had to scoop for ourselves a nest among the cargo.

After a few hours at sea I realised that the stories I had heard of dhow discomforts were not exaggerated. Anyone who can withstand their sickening smells and treacherous gait is a true sailor. The equatorial sun blazed down upon us and there was no shelter from it. The sea gleamed like polished metal and pained my eyes. Flying-fish spun across our bows to disappear once more in their element.

About midday the Arab sailors had their first meal. A large bowl of rice prepared by a Swahili cook was placed in their midst and they squatted round eagerly to clutch out the usual large handfuls. But before they started eating, one of their number came across and asked me to join them. I accepted, for these seamen possess simple natures and nothing upsets them more than when a proffered kindness is refused. On all my trips by dhow I do not remember one instance when their Mohammedan crews have started a meal without first offering their food to me. Mohammed himself said that his followers should always share their dates and rice with strangers and eat together out of a communal bowl for good fellowship.

After the rice was finished a large mug of coffee was passed round from mouth to mouth, and again I had the honour of being the first to partake. After doing so I was careful to hand the mug to the next Arab with my right hand, for as the left hand is always used by these people for certain ablutions they are scrupulously careful to offer food and gifts with their right.

Hours later, when eerie shadows enveloped the *Faza* like a soft grey mantle and when the lateen sail was flapping disconsolately in the night breeze, the captain

produced a soiled copy of the Koran and started to chant the chapters in a loud monotonous voice. Favourite verses he repeated over and over again, the crew and the Swahili passengers making a subdued chorus. This went on for over an hour. Then, before composing himself for a few hours' sleep, the captain offered up a short prayer asking for fine weather and good winds.

All through the night the helmsman sang steadily in the sing-song Arab fashion, his voice sometimes becoming lost in the wind, at other times rising to a dismal wail. The purpose of this continual sound was to scare away the evil demons that haunt the ocean during the dark hours.

For two days and nights we cruised along the Kenya coast, bound for mysterious Lamu Island, which as well as possessing some Persian ruins is famous for the great beauty of its women. When the wind dropped, the crew set up a curious kind of shrill whistling to attract it to them. This method of luring a breeze is a very ancient one and, as they continue doing it off and on until the wind rises, always succeeds.

As we drew close to Lamu the crew seemed to go mad. Drums were got out and loudly beaten, long poles were pounded on the deck, and others banged on empty tins with sticks. Arab seamen nearly always make this tremendous din when entering a new port, in order to attract attention. They are amazingly vain in a childish way and dislike dropping anchor in a harbour unless watched by a crowd from shore. In this case, the sailors were particularly keen to attract notice, as they were desirous of warning the Lamu girls of their arrival.

At Lamu I made my first acquaintance with a type of dhow called the *M'tepe*, and in one of them I sailed up a winding creek to view some of the Persian ruins. The *M'tepes*, which are largely built at Lamu, have their side-planking sewn to the skeleton vessel's frame by hand. They are quite seaworthy, but tend to ship water. Their design is exceedingly old and has not



Denis Palmer

Another variant of the dhow is the odom, plying between the Laccadive Islands and the Malabar coast of India, where the descendants of Arab traders and Hindus are known as Moplahs



Denis Palmer

Of fine physique, the Moplah sailors are famed for their Moslem piety



Denis Palmer

The perfectly curved little bay of Androth, chief island of the Laccadives. In the background can be seen the sheds in which the odoms are stored when not in use



Denis Palmer

Sliding an odom onto palm-wood runners, ready for hauling up the beach

changed at all. In A.D. 60 a Greek sailor, while visiting Zanzibar, wrote in his log-book: 'In this place are sewn boats.' They came from Lamu. It was then, and is today, one of the chief dhow-building centres on the East African coast.

The old Chinese junks used to call at this island and one can presume that the hardy junk seamen made themselves thoroughly at home, because many of the Lamu-ites have high cheek-bones and slanting almond eyes. The keenness of Lamu boys for kite-flying may also be traceable to

them. Pieces of Chinese pottery are often dug up on the beach.

I eventually returned to Mombasa in a larger craft which was heavily laden with copra. When we had been waiting at Lamu for several days for a favourable wind to allow us to tack down the narrow creek, the day that it chose to veer round in the right direction happened to be a Friday. The captain and the whole crew refused to sail, for Friday is the Moham-medan day of rest and rarely does a dhow put to sea on that day.



Denis Palmer

In the Mergui Archipelago are found the Selungs or sea-gypsies, expert fishermen, who live almost permanently afloat. Here they have built themselves an encampment on stilts over the water



Denis Palmer

A fleet of fishing-canoes among the Mergui islands, off the coast of Lower Burma. The local fishermen sell pearls and edible birds' nests to the Chinese junks that visit the islands

The most interesting dhows seen in Mom-basa are those of the fleet that every year comes from Cutch and the Persian Gulf with the north-east monsoon. These ocean-goers possess exquisitely carved, highly built-up poops and most of them are two-masters. Some of them reach nearly three hundred tons, while the smallest of the coasting dhows are only about twenty tons.

Somewhat similar in general appearance to the vessels from the Persian Gulf are the fleet of dhows known as *odom*s which ply between the Laccadive Islands and the Malabar Coast of India. They are usually painted black and white, and have fantastic designs wrought on their castle-like sterns. Their crews are Moplahs, a people of mixed Hindu and Arab descent, and are fine physical specimens. The Moplahs of the Laccadive Islands are known all over the East for their great piety and know-

ledge of the Koran, and their wise men lecture as far away as Singapore.

When I met Pazyagam Thangal Koya, captain-owner of a large *odom* in Calicut, and arranged that he should take me to Androth, chief island of the Laccadives, I was not surprised when he first demanded forty-five rupees. By then I knew the temperament of these Eastern seamen. In nearly every case they ask for a large sum of money for the passage and then when the voyage is completed refuse to accept a penny. You have only to treat them with sympathy and understanding and they become your firm friend. I always felt absolutely safe when trusting to their beneficence.

When I boarded Thangal Koya's *odom* I was told that we first had to sail fifty miles north to Cannanore, as he desired to recite a special prayer in the big mosque

there. There was no cargo to pick up at this port, but both he and his Moplah sailors were anxious to pray in the mosque!

The coral Laccadives are such low-lying specks, their highest land-point being less than ten feet above sea-level, that the crews of the *odoms* have a quaint custom to ensure that the islands are not passed by mistake. On nearing their vicinity, about every fifteen minutes a different sailor climbs the tapering mast and scans the seas for sign of land; and the first man who sights the island shores is given a present by everyone aboard.

In most places the dhows when not in use are left anchored in the harbour or up somesheltered creek, but in the Laccadives, where there is not much protection from storms, they are hauled from the lagoon and kept in large thatched sheds.

On the eastern side of the Indian Ocean

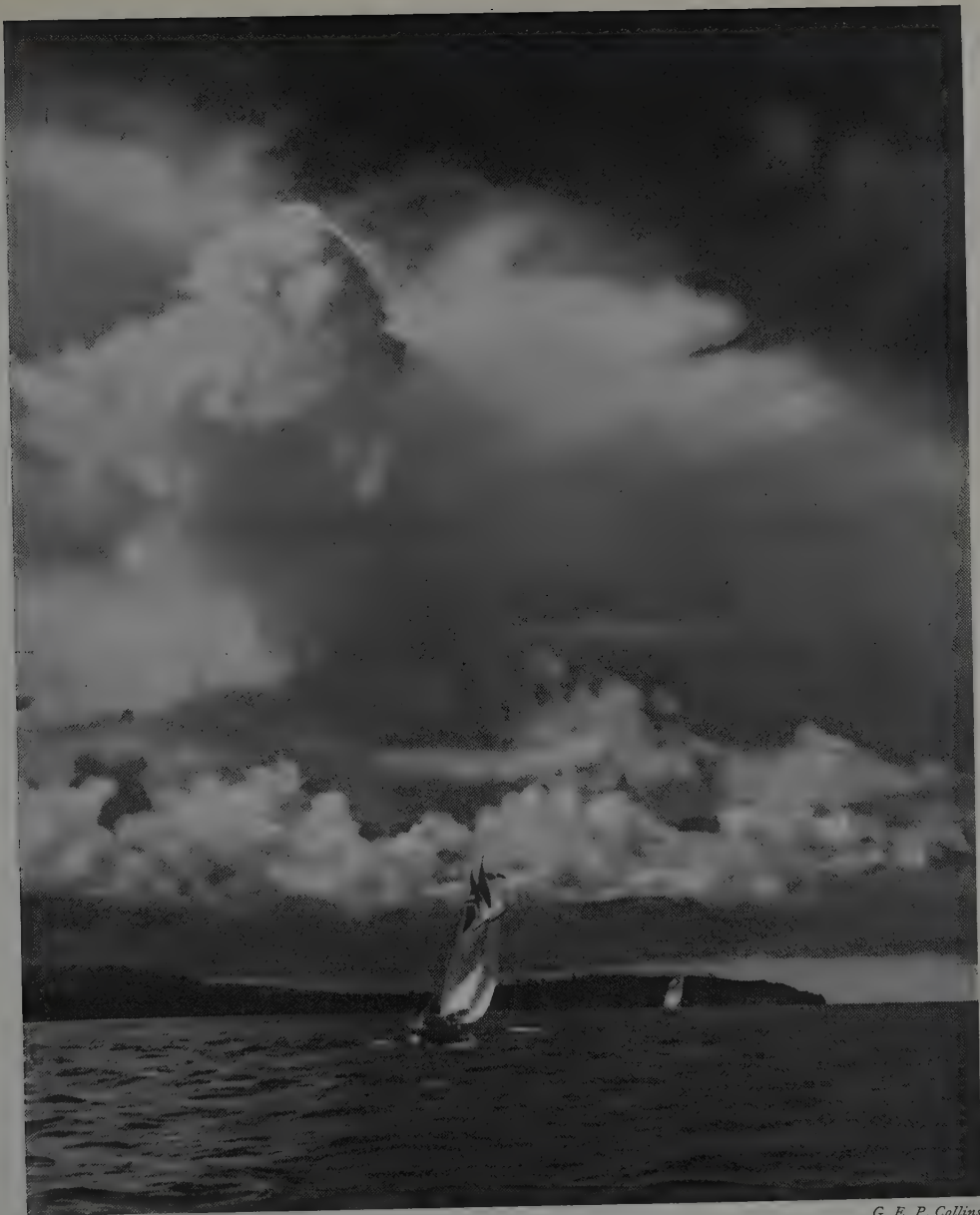
the seamen tend to use a lighter type of craft, the *prahu*, which more often has rectangular sails than three-cornered, as on the western side. In such a boat I sailed amongst the labyrinths of the Mergui Archipelago looking for Selungs, or seagypsies, those curious people who live almost permanently afloat, rarely staying ashore for more than a day or two at a time. Chinese junks are sometimes seen in these islands, either pearling or searching for the birds' nests from which the Chinese make their favourite soup.

Another craft used in the Malay Archipelago is a small outrigger *prahu*, which floats so low in the water that in the distance it has the appearance of a log raft. In one of these I sailed from Benoa in Bali to the tiny neighbouring islet of Poela Serangan. The Balinese sailors also whistled when the wind failed.



G. E. P. Collins

Sailors' sons at Bira in Celebes with their model prahus, some carrying triangular 'lateen' sails, others square-rigged like the Portuguese caravels from which a local design derives



G. E. P. Collins

Bira prahu in full sail

A few months later, when I chartered a *prahu* at the village of Sapi in Sumbawa to voyage to Komodo, the relatively unexplored island home of *Varanus Komodiensis*, the giant dragon-lizard, I witnessed another method of attracting wind. Whenever we were becalmed, the *prahu* boys got out a large bronze gong and thumped and crashed it vigorously for hours on end.

Voyaging by dhow in Eastern waters has given me a lasting respect for the qualities of the varied types and nationalities which man them. Linked by a

common religion and a common tradition, these Moslem sailors of the Indian Ocean face with the same gallantry and inherited skill, and with a minimum of navigational instruments, the perils of the deep in regions where there are often no light-houses or lighted buoys to give warning of hidden reefs. Among them, even in this mechanical age, the adventurous may recapture something of the spirit and the experience that marked the sailor's life in the days of Nearchus, Alexander's admiral, or Hiram, King of Tyre.

THE GOLDEN EAGLE'S EYRIE

THE following remarkable pictures of the Golden Eagle's domestic life were taken in the Scottish Highlands by two skilled and patient observers, Mr and Mrs Seton Gordon, whose adventures in securing these and many other unusual bird-photographs are recorded in Thirty Years of Nature Photography, recently published by Messrs Cassell



A father Golden Eagle brooding an eaglet in the nest, while the mother listens to its cheeping.





Sheltering her eaglelet from the heat and glare of the sun





The falcon's chick is reared by its mother.



The father feeding the eaglet ; this is rare, though he brings all the prey to the eyrie



The Golden Eaglelet, fully grown, practises wing exercises



The Oxford University Arctic Expedition, 1935-6

by ANDREW CROFT

The expedition herein described by its second-in-command was planned under the auspices of the Oxford Exploration Club and, financially speaking, was made possible by the support of the Royal Society, the Royal Geographical Society and the generosity of the University as well as of certain Oxford and Cambridge colleges. British firms played their part by contributing goods to the value of about £2500

NORTH-EAST LAND—north-east of Spitsbergen, roughly a thousand miles north-east of Iceland and less than six hundred from the North Pole—is rather larger than Wales and for the greater part of the year is entirely covered with ice and snow.

This was the destination of the Oxford University Arctic Expedition led by Mr A. R. Glen and organized by Mr A. Dunlop-Mackenzie, which returned to England last September after spending fourteen months in a country where no expedition had succeeded in wintering before. Though it had previously been regarded as a land of mystery where life was almost impossible, it proved less forbidding and lifeless than the foregoing description might indicate. Indeed, the expedition was to some extent dependent for its sustenance on the local fauna, since, owing to financial exigencies, insufficient dog-food for so long a period was taken, and seal-meat was used to supplement their diet as well as, whenever there was enough, that of the men.

Besides a complete survey of this little-known country, the expedition's programme included investigations into its life, land and ice structure, as well as a continuous research on the ionosphere, the region in the upper atmosphere which is responsible for the long-distance propagation of wireless waves.

I left England earlier than the nine other members of the expedition in order to meet at Copenhagen the twenty-three sledge-dogs which I had previously ordered from

Jakobshavn in West Greenland. On July 26 the expedition ship, the 70-ton sealer *Polar*, left Tromsø in Norway.

North-East Land was reached in seven days and a suitable site chosen for a base on the north side of the entrance to Brandy Bay, at a latitude of $80^{\circ} 23' N$. The base-hut, 30 feet by 20 feet, consisted of a large living-room and bedroom with a small larder and hall; above was a loft for storing equipment. Its design was by no means perfect and the stove was inadequate in cold weather when the bedroom might be 40° below freezing-point with its walls thickly covered by hoar frost.

Wright, Keith and Bengtson constituted the first party to set out from the base. They travelled in a 22-foot whaleboat, driven by a small Seagull outboard engine, and succeeded during the next four weeks in mapping the whole of the comparatively unknown north coast situated to the west of Rijps Bay. This coastline is a fringe of rocks and boulders up to eight miles or so in width, and behind it is a vast sheet of ice and snow which covers about three-quarters of the country. Weather conditions are more severe towards the east, so the strip of land becomes narrower and narrower until on the east coast itself the ice goes right down to the sea. Here the ice-cliffs, more extensive than anywhere outside the Antarctic, rise sheer up from the sea to a height of 200 feet in places, and, except for three small areas of land, stretch continuously for about 150 miles. The North-East Land ice-cap, like the

larger and more famous one in Greenland, is gradually retreating; in fact it is only in fairly recent times that the land valley running through the centre of the country has become exposed and has thus, strictly speaking, divided the ice-cap into two.

One of the expedition's main problems was the study of this glacial retreat. Glen therefore decided to have two ice-cap stations—one situated on a high ice-dome overlooking the north coast, under his own charge, and the other in the centre of the western ice-cap, under the physicist Moss. In order that really good work should be done, these stations were to be fitted with every comfort possible in the circumstances. The expedition ship had been unable to penetrate the sea ice when she arrived in Brandy Bay, and the base-hut had therefore to be placed in an extremely awkward position from the point of view of sledge journeys. Fortunately the bay ice broke up before the ship returned to

Norway and she was able to transport stores to the head of the bay, where a good route up onto the ice-cap had been found. Near this spot, to act as a sledging base where the dogs and all the sledging equipment could be kept, and as a connecting link between the main base and the two ice-cap stations, a small trappers' hut was established, after being towed astride two whale-boats from one side of the bay to the other and rolled up the shore. This did not seem very good for the hut, but the fact that it did not burst asunder during the process was a testimony to its quality. Although lengthened, the hut measured only 14 feet by 5 feet, but its very smallness was an advantage during the cold winter months and it proved a surprisingly warm home. Two dog-houses were built alongside; unfortunately huskies dislike captivity and ours frequently succeeded in chewing holes in the tin-lined hut walls and escaping onto the roof, where the dog-





Andrew Croft

The first expedition to winter in North-East Land consisted of ten men: two physicists, two surveyors, two biologists; a geologist, an ionosphere and wireless expert, a ski-ing expert and the author, who combined the functions of chief dog-driver, photographer and second-in-command. In the front row above are (right to left) Messrs Dunlop-Mackenzie, Glen, Godfrey, Wright and Croft; behind are Messrs Bengtsen, Hamilton, Keith and Whatman.

(Right) Landing stores near the main base in Brandy Bay



Andrew Croft



Andrew Croft

At the head of Brandy Bay a small trappers' hut—which survived the ordeal of being rolled up the shore—was established as a sledging base, and dog-houses built alongside



Andrew Croft

The huskies lost no time in chewing holes in their tin-lined hut walls and escaping!

food was often kept. Needless to say, neither these antics nor the thinness of the wall separating the hut from the dog-houses were very conducive to the inmates' sleep.

The overland route to the ice-cap was not particularly difficult, although travel was complicated by summer thaw streams. A two-wheeler cart proved a partial success, but a three-wheeler arrangement would have been much better still. The ice-cap ascent was decidedly steep and the blue ice prevented the dogs from getting an adequate grip. However, we eventually reached a part of the ice-cap beyond the blue ice and yawning crevasses and dumped our loads. Early in September five of us started out on the first journey to establish the central ice-cap station, marking the route with half-mile flags. Godfrey and I then returned and spent the next month transporting about twelve tons of stores and equipment to the central, and later to the northern ice-cap station.

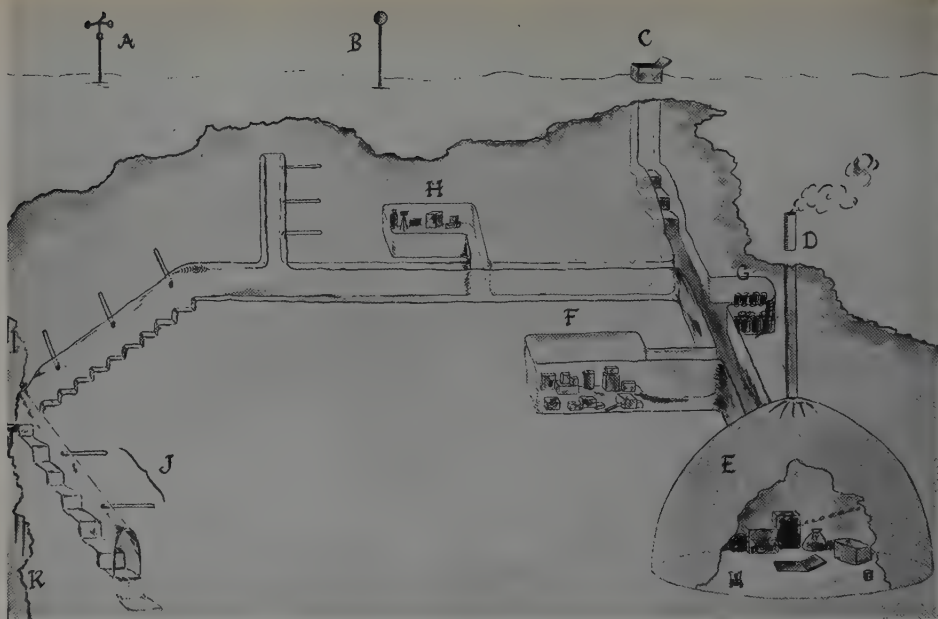
The memory of that period is still very vivid: creeping forward from flag to flag, getting hopelessly lost in blizzards when within a mere mile or so of our destination, but feeling all the time that we were never truly alone. Anyone with a fairly keen imagination cannot help seeing strange shapes and forms when diffused light or blizzard reduces his horizon to about four yards. Unfortunately we lost three dogs down crevasses during these journeys; this, allowing for injuries, brought their numbers down to seventeen.

Meanwhile Glen, Mackenzie and Moss were busy making the first ice-cap station. A circular hole was dug 5 feet deep and 14 feet in diameter; a tent shaped like a gigantic umbrella was then placed in the hole and its floor covered with a double layer of planking. The tent would soon become completely drifted over with snow, so the work of tunnelling had to be begun at once. A packing-case sunk into the snow, with its lid hinged to form a trap-door, gave entry down a 20-foot shaft into

the main tunnel which led to the tent. This was finally reached by a second trap-door through the wooden floor. The interior was always comfortable, and never once in ten months did it fall below freezing-point, often contrasting strangely with the biting cold of a blizzard outside. Between the temperatures of the two, there was sometimes a difference of 130° Fahrenheit. A wireless receiver and a transmitter, using current generated by pedalling a bicycle attached to a dynamo, occupied one side of the tent and various scientific equipment the other.

The tunnel system was like a rabbit warren. It included a safety cavern for use in case of a disaster to the tent, a paraffin-house and a storeroom in which the food was truly on ice. A second passage about 50 feet long led to a shaft, which was driven down nearly 40 feet for examining conditions deep in the ice and the taking of temperatures at varying depths below the surface. Keith was working on this when his ice chisel cut through into a cavity below and he found he was on top of a giant internal crevasse. This was later opened by Whatman and found to consist of three tunnels, one above the other, each blocked by curtains of long icicles which had to be cut down before a way could be made through them. At some points it was like the tangled vegetation of a forest; at others it resembled the Cheddar Caves, but far surpassed them in loveliness. Seventy feet below the surface, and probably only a few feet from the land below, was a lake, in which Moss swam to explore the farther limits where it flowed into darkness beyond.

Owing to our high latitude and proximity to the North Pole, the dark season lasted four months. By the time the two ice-cap stations had been completed, the sun had already set below the horizon and the sledging season should have closed down for the year. Wright's survey programme, however, was ambitious and we had very few dogs. It was evident there-



After a sketch by R. Moss

The expedition's most unusual feature was the maintenance throughout the winter of two ice-cap stations. Plan of the central station. A. wind-speed indicator; B. hoar frost indicator; C. trap-door; D. air and steam vent; E. tent; F. larder; G. paraffin store; H. spare tent and stores; J. thermometers; K. edge of internal crevasse



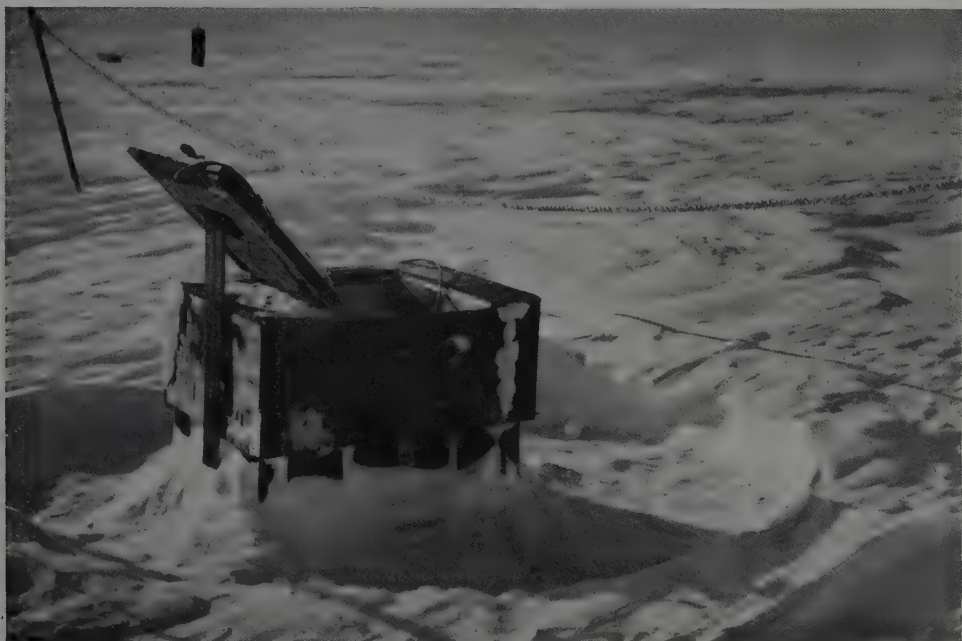
Andrew Croft

September 1935: the central ice-cap tent when first placed in the hole dug for it



R. Moss

May 1936: the tent now lies buried some 7 feet below the surface, on which are seen a wireless mast and meteorological instruments, from which readings were taken thrice daily and transmitted via Bear Island (between Spitsbergen and Norway) to England. In the centre is the trap-door through which some 40 tons of ice were removed in excavating the tunnel system



Andrew Croft

The trap-door entrance. The ropes acted as guides to prevent straying in the winter darkness



Andrew Croft

Deep in the ice was the central station's larder. Three quarters of the food brought was in tinned form, but there were also ham, potatoes, onions, rice, etc. Supplies were carefully rationed and lasted well

Andrew Croft



Inside the ice-cap tent. R. Moss (who spent three of the ten months here alone) measuring the daily snow density. Above his head are his fur boots: behind him are the wireless receiver and transmitter. He is kneeling on one of the steel-and-canvas 'Hounsfield' beds

In the course of tunnelling a shaft to a depth of nearly 40 feet a giant internal crevasse was discovered. Its ice stalactites glittered blue and green in the light of the pressure lamps

Andrew Croft



Andrew C



Exploring the crevasse. The thaw created by human warmth and that of the lamps necessitated the wearing of oilskins and sou'westers. Seventy feet from the surface, its depths were the lowest ever reached beneath an ice-cap. In it were found some of the largest ice crystals yet discovered

fore that the only way to further his plans was to establish three food depots in various parts of the country; and that the farthest one should be taken to Cape Leigh Smith at once. Wright and I, therefore, started out on October 23 and, after a hard struggle hauling sledges over Rijps Valley, were the first party ever to reach Cape Leigh Smith by land. Around the cape itself we found a wilderness of crevasses extending far inland, into which we blundered in the darkness and were finally stopped by a vast system of inter-joining fissures.

Here we had to lie up for three days hoping for the weather to improve. We were running short of food and the poor dogs were so famished that they were eating their traces, harnesses, our own fur boots, rucksacks, in fact anything edible they could find. There was always the fear that the dogs would stray into the crevasses after they had eaten their way loose. Wright had made a paraffin lamp, as we were short of candles, and the smoke-begrimed inner-tent caught on fire; only a few days previously a terrific wind had torn away part of the snow-flap which helped to hold a 'pyramid' tent to the ground. These damages had to be repaired and we spent most of one day busy with our needles and thread. After several narrow escapes from breaking snow bridges we managed eventually to find our way out of this crevasse zone.

The next day, within a mile of the proposed site for the depot, a bear suddenly loomed up out of the darkness and quickly approached our two sledges. A rifle had, stupidly, not been taken, as it was essential to travel as light as possible. Loud shouting made him stop 50 yards off, but it was then stalemate, for he effectively barred the way and remained impervious to insults. The dogs became wildly excited and were with difficulty restrained from an attack which would have precipitated a general engagement. While I kept the dogs back with

my whip, Wright went forward and the bear approached to within a few feet, hissing angrily. After a spirited game of bluff, during which the bear reared up on his hind legs and Wright made several passes with his ice-axe, the bear suddenly gave way and lumbered off. No time was then lost in establishing the depot and in putting ten miles of ice-cap between ourselves and the scene of the encounter. It was now full moon and the weather for once was kind to us; travelling nearly 30 miles daily, we eventually reached the northern ice-cap station in the middle of November, after a journey of about 250 miles.

There we were regally entertained by the two occupants, Glen and Mackenzie, who gave us a grand meal of tinned kippers, York ham and buttered scones. Our expedition never ran short of food, as there were always ample supplies of tinned meats and vegetables of all sorts, as well as fresh onions and potatoes. The latter keep perfectly well in the Arctic provided they remain permanently frozen. At this station bread and cakes were regularly baked in an oven made out of an old biscuit-tin, which made up in practicability for what it lacked in appearance, except that its habit of dropping molten solder on icing cakes was admittedly deplorable. Mackenzie and Wright drove down to the sledging base the same day, while I took the former's place at the station and for the next three weeks led a very pleasantly slack existence there.

This station, being cut out of blue ice, was not nearly so comfortable as the central one. Owing to the non-porous nature of the ice, heat generated from the tent melted the ice surrounds; as a result many bucketfuls of water had to be pulled up daily from the passage and through the trap-door entrance. I eventually vacated my post in a somewhat unorthodox manner. While taking the meteorological readings (these were taken three times daily) I was knocked over by the wind and



Andrew Croft

(Above) *At the northern ice-cap station after a blizzard. The pyramid tent is snowed up and the ice-axes have assumed strange shapes. Here two men lived for four months*
 (Below) *Reading instruments at midday during the dark season (October-February)*

Andrew Croft





Andrew Croft

Above) Arctic journeying, for about eight months of the year, makes no distinction between frozen land and frozen sea. Where they join, sea-spray has flung a magic cloak over the rocks
 (Below) The low sun, in the crystal-clear air, lights the landscape with unforgettable colour

Andrew Croft





The flag near the base camp at Brandy Bay

Andrew Cro...



Drift ice in Hinlopen Strait between North-East Land and West Spitsbergen



A. B. Whatman

Manhauling a sledge over the sea-ice to establish a biological station in Murchison Bay. An iceberg has been frozen in ; unless grounded on the bottom it will move away with the thaw

was unable to find the station again. Armed only with a minimum thermometer, and this due for repair, I wandered about in a blizzard for some sixteen hours. Eventually, after a short rest in a hole dug in the snow, I made my way down to the sledging base, steering by the wind. Meanwhile Glen had a miserable time circling round the station with a long rope in the hope of finding me. Fortunately, the next day was fine and his anxiety was put to an end by the arrival at the station of three of us, complete with a dog team and a pair of dental forceps. He and Mackenzie once more proved their skill by extracting one of my teeth and I then left for the central ice-cap station with Godfrey; here we warned the occupants of our arrival to the tune of *Good King Wenceslas*; we were 'waits' true to type—it was still a fortnight before Christmas. Keith returned with me to the sledging base the next day and a fortnight

later the newly formed bay ice enabled us, accompanied by Wright, to reach the base on Christmas Eve.

Whatman and Hamilton had been practically alone at the base ever since September. They had been carrying out meteorological observations, measuring atmospheric ozone, studying the Aurora Borealis, and also doing research work in connection with the further development of wireless communications throughout the world. Their meteorological reports were transmitted three times daily to the Norwegian Government's station at Bear Island, whence they were retransmitted to Norway and England.

One of the first problems that faced radio engineers was to account for the possibility of sending wireless signals round the earth, say from London to Melbourne, for it could be shown that they would not bend sufficiently. In recent times a num-



A. B. Whatman

One of the expedition's light-weight boats (here protecting a tent during the summer rains) composed of canvas over a framework of ration-boxes lashed to a Nansen sledge

ber of reflecting layers, situated up to a height of 250 miles above the earth's surface, thus making round-the-world signalling possible, have been discovered in the sky. No information about these layers in Polar regions had been obtained from farther north than 70°, previously to our expedition. A succession of waves was sent vertically upwards from a special transmitter and each one examined on return from the layers above, by means of a device which enabled them to be seen with the eye and photographed.

The month of January was spent in preparing for the spring and summer sledge journeys. One of our problems was to design and make a light-weight boat, which could be used in any emergency. Nansen sledges with ration-boxes lashed to them and covered with canvas afforded a solution, proving capable of carrying two men and about 500 pounds of equipment, and

adding only an extra 23 pounds or so to the sledge loads. For oars we lashed ice-axes to the heel ends of two skis.

In February Godfrey, Keith and I started off by moonlight to establish two more survey depots in the south-west corner of the island. We experienced temperatures round minus 40° Fahrenheit, and, as our sleeping-bags became frozen stiff with hoar frost due to the experimental use of a single instead of double tent, the cold was felt pretty acutely. Finally, the state of our sleeping-bags became so farcical that we spent the last few nights huddled round a Primus stove in a vain attempt to keep warm.

On February 26 the sun rose above the horizon and the four months' winter darkness was at an end. A few people had certainly felt the lack of sunshine, but those of us who had been kept busy throughout were genuinely sorry not to have had more



A. B. Whatman

Polar bears follow the edge of the sea ice near the 'leads' of open water, hunting for seals. The biologists shared Murchison Bay amicably with a she-bear and two cubs



A. S. T. Godfrey

One of the biologists with a seal stalked for three hours and caught by hand



Andrew Croft

North-East Land has too severe a climate for many birds to nest there, but the breeding species include eider duck, arctic tern, red-throated diver and purple sand-piper. This is an eider's nest, lined with down from the parent's body



D. B. Keith

An eider duck on the nest, in the 'crouched' position which she assumes in face of danger. Eiders usually breed in colonies, often on small islands, free from the depredations of the arctic foxes which prey on their greenish-coloured eggs and their young



Two young purple sandpipers from the same brood: one the usual rich chestnut brown with black markings; the other almost completely albino—pale fawn-grey with pink legs, beak and eyes—very conspicuous by comparison with the normal protective colouring

time to enjoy its strange attractions and even regretted that it was over.

The spring is the best time of year in the Arctic. The atmosphere is beautifully dry and invigorating, the sledging surfaces excellent and, owing to the low altitude of the sun, the unforgettable tints and colourings peculiar to the Arctic are at their best. Some of us thoroughly enjoyed an occasional hour or so ski-ing. The cold, however, was usually too great to allow the snow particles to melt under the downward friction of the ski. Consequently fast running conditions were seldom experienced.

Throughout the winter the sea ice to the north of North-East Land had been under observation from the northern ice-cap station and it was seen to be driving rapidly back and forth as a result of the violent gales and strong coastal currents. Glen and I started out early in April sledging northwards over the sea ice, our intention being to investigate weather conditions, comparatively with those at the central ice-cap station, and to study the drift and physical factors of the sea ice itself. A wilderness of pressure ice blocks, heaped on top of each other in ridges sometimes 20 to 30 feet high, stretched on all sides. This was only relieved in a few places by flats of newly frozen ice marking some recent lead of open water.

By hard travelling we hoped soon to reach the far side of the drift ice zone, which we found to be under the influence of such strong winds and currents. All went well until Glen had the misfortune to be knocked over during a blizzard and suffered concussion. This blow paralysed his back slightly and it was essential to return to the base as soon as possible. The return journey of little over 100 miles lasted a fortnight. The larger of our two sledges was so badly broken that it could only be towed backwards, very lightly loaded; and as a result the problem of one team of eight dogs pulling two sledges became more acute. I had to urge on the dogs and haul on the traces while Glen struggled vali-

antly to prevent the sledges capsizing. He was in great pain throughout and we were on the whole lucky to get back to the base without any further complications.

After ten days' rest he had recovered sufficiently and we started out on another sledge trip; that of circumnavigating the country and doing survey work, geology and glaciology *en route*. We reached the land to the south of Cape Leigh Smith in $4\frac{1}{2}$ days, and there saw for the first time those magnificent ice cliffs which have already been mentioned. In certain places the ice-cap behind these cliffs is highly crevassed owing to the formation of the land beneath, and big ice blocks can often be seen calving off the tumbled face of the cliff itself. For the most part, however, these cliffs are not subject to any particular pressure or movement.

While we were surveying one of the three areas of land which the retreating ice-cap has exposed in this neighbourhood, a seal was shot lying on an ice-floe and the dogs' hunger got the better of their discretion. The tide suddenly changed and the floe, complete with four dogs and the seal, moved rapidly seawards. We tried swimming out to the dogs but cramp soon overcame our efforts; ironically enough, this was the only major journey which had left the base without the Nansen boat previously described. The next day, however, we saw the dogs perched on a ledge high up on the ice cliffs opposite our camp; the ice-floe must have been carried alongside the cliff, and the dogs, having succeeded in reaching the ledge, had obviously lost their nerve and could move no further. There was therefore no other alternative than to cut one's way step by step up the cliff face in order to reach them. It was slow work, as I was wearing skin boots and these are about as much use on ice as rubber soles are on wet rock. The result was that when I had brought three dogs safely down I slipped with the fourth, and, to the dog's amazement, did the next 70 feet in record time, landing up on an ice-floe below.

A feature of this journey was the wind which, during one particular period of fifteen days, averaged over forty miles an hour; and in the meantime, Mackenzie and Wright's survey of the intricate north coast was interrupted by the same windy conditions and they had to return to the base. Only half the survey of the north coast had been completed, and although previous expeditions had found travel on the ice-cap to be virtually impossible at the end of July, Wright and Hamilton left the base on the 19th for Cape Leigh Smith, which was reached after nine days' travel. From there they sledged westwards along the edge of the ice-cap, and, taking full advantage of a period of continual fine weather, completed the whole survey after a fortnight's work. They returned to the base three days before the ship arrived.

In July Glen and Bengtsen made a geological journey round the north coast to Rijps Bay. The rock structure of the country was mapped in detail from North Cape to the edge of the eastern ice. Having lost their Nansen boat in a storm about 100 miles from the base, they succeeded in constructing another out of drift-wood and two Lilo rubber mattresses, in which they travelled about seventy miles, being finally picked up by a hunting ship which brought them back to Brandy Bay. This party was dependent for food upon hunting, as the supplies taken were only sufficient for a quarter of the time.

Meanwhile the biological station in Murchison Bay was occupied by Keith and Godfrey for the four summer months. Two dog-sledge journeys in March had taken the bulk of the station's equipment, but the final load, which had to be man-hauled there by the two biologists assisted by Whatman, was exceedingly heavy. A she-bear and two cubs shared the bay with them, and after a period of probation social relations between them became settled and were never strained by any act of hostility

on either side. Later on when the bay ice broke up two reindeer were also marooned on the island. There are probably about 300 or so of these animals still existent in North-East Land, and although they are protected by order of the Norwegian Government, many are unfortunately shot every year by misguided seal-hunters. It is wonderful how these reindeer manage to survive the winter, as they must often have to burrow through about two feet of snow before finding sufficient mosses and lichens to satisfy their hunger. Keith was mainly engaged in studying the mating and breeding habits of the birds in the district. Although the climate of North-East Land is too severe for many birds to nest on its shores, the breeding species include—besides the sea-birds which nest in large cliff colonies—the eider duck, arctic tern, red-throated diver and purple sandpiper. On one occasion a seal was stalked so successfully that, while Godfrey prevented its escape by lying on its ice-hole, Keith seized its flippers and dragged the miserable creature to land. The seal's portrait was then taken and the animal loosed.

Whatman, Moss and I arrived at this station at the end of July. Moss had abandoned his ice-cap home the previous month as the roof was in imminent danger of caving in. He had been alone since March, and during the ten months of the station's existence had superintended its scientific programme. The two biologists accompanied Whatman and myself across the 12-mile-wide Hinlopen Strait and deposited us on the Spitsbergen coast before returning to evacuate their own station. We spent the next three weeks sledging through central Spitsbergen and climbing some of the highest peaks *en route*. We finished our journey in the Ice Fjord, and there, on August 23, were picked up by the expedition ship which had left Brandy Bay with the other members three days before.

The Albert National Park

by HENRI HACKARS

The words 'National Park' are commonly employed in more senses than one. Sometimes they indicate an area preserved from destructive exploitation and made accessible to the public; sometimes, and more rarely, they mean a true nature-reserve in which the natural balance of fauna and flora is protected for scientific ends against human interference. Such is the Albert National Park; and to M. Hackars, who as 'Conservateur' is directly responsible for its administration, we owe the following authoritative account of its origin and purposes

THE wide region between Lake Kivu and Lake Edward, lying astride the frontiers of the Belgian Congo, Ruanda and Uganda, consists of an imposing central massif of volcanoes, some of which are still active, of wooded mountains and marshy plains. It is virgin country, offering abundant opportunities for study—geological, geographical, zoological, botanical and anthropological.

His late Majesty King Albert of the Belgians was one of the first to realize the scientific interest of this territory. He gave personal encouragement to the scientists, both Belgian and foreign, who, in consequence of the expedition made in 1921 by the late Mr Carl Akeley of the American Museum of Natural History, urged that no time should be lost in taking measures to preserve these natural riches from rapid and complete destruction. The encroachments of colonization directed to profitable ends, uselessly destructive methods of cultivation, hunting in its inherent nature—all these increased daily the threat that the flora and fauna of this region were doomed to disappear.

Already, during the last century, man had begun to realize that sooner or later he would end by paying for his reckless victories over nature. On the African continent, governments had till then confined themselves to utilitarian considerations, taking for granted a natural increase in game that would periodically restock hunting-grounds depleted by wholesale slaughter.

It was not until 1901 that a decree was made to regulate hunting in the Independ-

ent State of the Congo and to put into concrete form the conclusions reached by the International Conference for the Protection of African Wild Animals. Nor, until 1920–25, were game reserves, judiciously established and efficiently supervised, created in the Belgian Congo. Real progress was made; but the angle from which the problem was approached proved to be still too narrow, and its scientific implications were as yet disregarded.

At that time people were still trying to reduce the destruction of wild animals, but only because they feared to find themselves deprived of a rare pleasure or because the disappearance of game also meant the end of a cheap source of food supply.

The idea that one day the preservation of existing species, vegetable as well as animal, might give rise to discoveries of scientific and, at the same time, economic importance, had not yet found expression on African soil. The United States, however, had for a long time been setting an example: the foundation of the Yellowstone National Park dates from as far back as 1872.

In 1909, after a journey to the Congo, Prince Albert of Belgium (as he then was) voiced a similar suggestion. The pre-occupations of the first years of his reign, followed by the war, delayed the execution of his project. During a voyage to the United States in 1919 H.M. King Albert again expressed his desire to see national parks, comparable with those in America, established in the Belgian Congo. Baron Cartier de Marchienne, at that time Belgian Ambassador at Washington, took up

and acted upon the King's suggestion. Assured of the enthusiastic support of certain Belgian and American scientists and fortified by their approval, he was soon leading a movement which brought the ideas of the Belgian scientific world into line with the King's views. Meanwhile, Mr Carl Akeley's explorations gave further support to King Albert's argument. Akeley declared, in particular, that the creation of a small reserve at Kivu to save the gorilla from extinction was an urgent necessity. This reserve, which he suggested should be called the 'Gorilla Sanctuary', was to cover a few square miles, including the summits of the three volcanoes, Mikeno, Karisimbi and Bishoke. In spite of a certain amount of unreasonable opposition, this project was carried out; and it is to the enlightened instinct of King Albert that we owe it.

On April 21, 1925, a decree was promulgated which created at Kivu, under

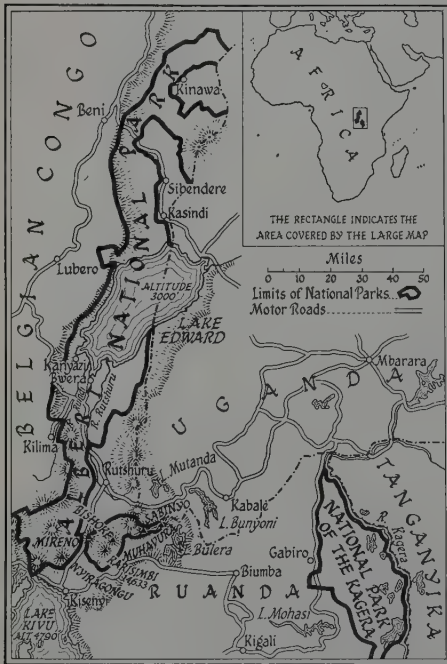
the name of the Albert National Park, a reserve of about 48,000 acres for fauna and flora, enclosing the three volcanoes suggested by Akeley.

In 1926 a new expedition, under Akeley's command, left for Kivu. Its purpose was to survey the park, fix its exact boundaries, prepare a map, study the possibilities of enlargement and reconcile, as far as possible, the conditions necessary for a complete reserve with the interests of natives and colonists.

Alas, Akeley's devotion to this great cause cost him his life: but his work was done and Belgian scientists, led always by the remarkable far-sightedness of their sovereign, recognized that, if such a vast scientific project was to be realized, much larger stretches of country and much more elastic and authoritative methods than had hitherto been employed were necessary. Two ordinances and a decree established progress in this direction. But King Albert was anxious to see the scheme completed, and on July 9, 1929, an Albert National Park was created with a status and powers sufficient to ensure the preservation of its domains for all time and the subordination of all activities within them to scientific ends. Greatly enlarged, covering nearly 480,000 acres, and enclosing, within a relatively small area, several different climatic zones, the new park consisted of three sectors of completely reserved land and a series of annexed territories at intervals between Lake Edward and Lake Kivu.

Comprehensive self-government; active co-operation between services in Europe and in Africa; intensive studies made on the spot by scientific expeditions; widespread international collaboration, of which the foundation of the American Committee and the London Conference of 1933 are outstanding examples—all these have enabled the park to fulfil ever more completely the objects of its existence.

In 1931 H.R.H. the Duke of Brabant graciously assumed the presidency of the



Stanford, London



All photographs by L. Lippens

The first great nature-reserve established in the Belgian Congo lies mainly between Lake Edward and Lake Kivu, here seen with one of the active volcanoes, Mt. Nyiragongu, in the background

Directing Committee, and under his leadership the institution acquired its final status. Prince Leopold's tour of investigation, in March 1933, through the different sectors of the park, and the masterly address which he delivered, on November 16, 1933, in London at the International Conference for the Protection of African Fauna and Flora, are striking proof of his interest and sympathy.

But in 1934 the nation was plunged into mourning: King Albert, the illustrious sponsor of the National Park, died. The acuteness with which the institution felt its great loss found expression in the words pronounced by Doctor Van Straelen at the solemn session of the Committee on April 21, 1934: "Humanity", he said, "is deprived of one of its strongest personalities. Belgium has lost a sovereign; science a protector and a friend. If the scientific institutions of this country owe much to King Albert, ours owes him everything. . . . The

first complete natural reserve formed in the Belgian Congo bears his name. One cannot imagine a more splendid monument to his memory than the great mountains of Kivu, covered with an incomparable carpet of forests—mountains on which he himself gazed with fervour. To our institution falls the honour of guarding this memorial. Faithful inheritors of the work of the late King, we will put our whole hearts into preserving this beautiful land, enlarging it and exerting ourselves until, in every part of the Belgian Congo suitable for the purpose, reserves may appear on the pattern of the Albert National Park."

After his accession to the throne, H.M. King Leopold III relinquished his presidency; but before resigning from the Committee, to which he had brought so much wise counsel and so many judicious suggestions, His Majesty graciously addressed a message to it, assuring it that he would continue to take an interest in its work.



Elephants dwell in the acacia forests and on the mountain slopes up to an altitude of 13,000 feet



Fearing nothing, now that man is no longer a danger, the feeding elephant wanders freely into the open, as curious to see the visitor as the latter is to see him

The King was not slow to keep this promise. Eight months later, on November 26, 1934, a decree was promulgated which extended the powers of the institution and substituted for the title 'Albert National Park' that of 'Institute of the National Parks of the Belgian Congo'.

The main ideas incorporated in the decree of 1929 were retained, but their application was made more elastic by modifications of detail, the result of five years' experience. Some sixty-odd miles east of the Albert National Park the National Park of the Kagera was established, covering 456,000 acres of completely reserved, and 192,000 acres of annexed, territory. The boundaries of the Albert National Park itself were extensively altered: its annexed territories being liquidated and thrown into a complete reserve of 936,000 acres which now, without a break, connects Lake Edward and Lake Kivu.

Finally, with the idea of giving financial encouragement to scientific research in the National Park territories, and thanks to the very generous help of a Belgian gentleman, there was established on October 1, 1934, the Foundation for the Promotion of the Scientific Study of the National Parks of the Belgian Congo. According to Article 2 of its statutes, this organization has for its object the encouragement of colonial scientific research, more particularly such as may be carried on in the Albert National Park, or in any other National Park conducted under the same administration.

The main practical problems are now virtually solved. The parks enjoy a definite status: their boundaries leave no room for ambiguity. In the Albert National Park constant vigilance eliminates almost any interference likely to modify the biological conditions in which the development of



The savannah country in the northern sector of the Park supports a vast animal population. (Above) A waterbuck, with the southern volcanoes faintly outlined in the distance. (Below) A common early morning sight: Cape buffaloes in the open woodland





Herds of Topi antelope (above) are abundant; they form the principal food of the numerous lions which inhabit the Albert National Park. (Below) A black-maned lion on the Ruindi plains to the south of Lake Edward



the fauna and flora takes place. Such measures, with the aid of the Foundation for the Promotion of the Scientific Study of the National Parks of the Belgian Congo, now enable an ever-increasing number of scientific expeditions to find, within the Albert National Park, completely virgin fields of study.

No more impressive statement of the aims implied in the establishment of nature-reserves like the Albert National Park, and no more vivid description of the park itself, could be found than in the above-mentioned address of Prince Leopold to the International Conference for the Protection of African Fauna and Flora. From it, accordingly, the following extracts are quoted:

"An analysis of the problem of the protection of nature leads us to study it in its relation to different forms of human activity. If we take the scientific aspect of the question, we see that nature-reserves form an indispensable adjunct to the laboratory. Until our own days scientific progress had been mainly the result of study and work in the laboratory; only to a minor extent was it the fruit of direct observation of nature.

"I have always been struck by the lack of knowledge revealed when the factor of *time* enters into a problem. Thus, if you ask a naturalist for information about the anatomy of some animal or microscopic creature, he will immediately furnish you with the most numerous details. But then ask him for information about, for instance, the length of an animal's life or how long some plant continues to grow, or, in general for any other explanation into which the element of 'duration' enters, and you will be astonished by the uncertainty of his replies.

"The study of natural phenomena can, however, only be complete if it includes that of successive evolutions and transformations which are not ascertainable within the lifetime of a single observer. The view we should get, through so comprehen-

sive a study, of the different phases introduced by geographical and bio-geographical elements would lead us to a better understanding of the natural factors on which the most diverse manifestations of human activity depend.

"Herein appears the fundamental rôle of nature-reserves. Besides playing the part of a storehouse, providing raw material for the laboratory, they form an ideal observatory for the naturalist. The economic advantages of protecting nature are now recognized by the whole world. The manifold discoveries of science, in agricultural economy, for example, declare most urgently the danger of thoughtlessly destroying vegetable life. Before the discovery of that economic treasure, rubber, a more intensive occupation and exploitation of the Brazilian forests, resulting in the extinction of the rubber tree, would have deprived us today of the pleasure of bowling comfortably along on pneumatic tyres! In the same way, heedless tree-felling in tropical Africa might have prevented us from tasting the delights of 'morning-coffee'!

"The history of man is marked by periods of indifference to nature, periods during which literary and learned occupations, analysis and intellectual speculation, alone seem able to hold his attention. But it is also marked by periods of enthusiasm: human activity is then impelled by the irresistible appeal of those physical and spiritual joys which accompany contact with nature and the contemplation of natural phenomena. Our epoch seems more and more to be characterized by such a return, as numerous manifestations in sport, travel, camping, hygiene and physical education clearly show. . . .

"The protection of nature is a problem of world-wide importance; the solution cannot be left to the initiative of isolated groups whose action, necessarily restricted, is unable to enforce all the measures requisite for effective preservation. The State alone can and must assume the responsibility for organizing protection on



The waters of the Albert National Park are rich in varied life. 'Immense troops of hippopotamus swim in the rivers, sleep on the shores and sand-banks and wallow in the warm mud of the marshes'





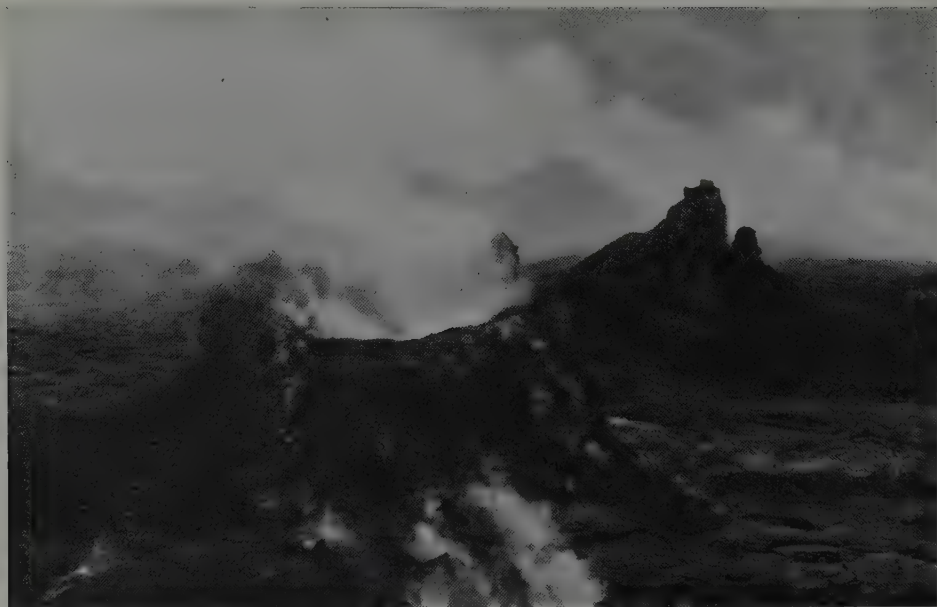
'Birds are numerous everywhere.' (Above) Vultures and Marabou storks surrounding a dead Thomas' cob (a kind of antelope). Note the candelabra-shaped euphorbia tree. (Below) Pelicans, and a white egret, on a small island off the southern shores of Lake Edward





(Above) Pink pelicans, an egret and a wood ibis at the same spot. (Below) Part of the huge colony of water-fowl. Birds can now 'breed abundantly, in natural conditions, without encountering any checks other than those imposed by nature'





The southern sector of the Park comprises a solid mass of high volcanic mountains. Their craters and secondary openings 'give the surrounding country the look of a lunar landscape'

a scale which calls for the co-operation of the whole of humanity in its moral, social, economic and cultural progress. This is the political aspect of the problem.

"Having set forth certain general considerations on the principle of the protection of nature, I should like now to bring to your imaginations a few pictures of the Albert National Park, the first sanctuary we reserved in the Congo.

"The Albert National Park, lost in the immense isolation of the heart of Africa, is situated in the region of the great lakes and the sources of the Nile, between Lake Edward and Lake Kivu. It presents two characteristic aspects: in the north, a vast plain; in the south, a massive group of mountains.

"Let us run over the northern sector. The great alluvial plain of Lake Edward is traversed by two main rivers which run parallel from south to north. Their yellow waters, whose colour discloses erosive

action, carry slowly back to the lake the earth of the very plain which it originated.

"Situated just south of the equator, at an altitude of some 3000 feet, this region has a tropical climate. The high temperature and the low rainfall give it the character of a savannah, lightly wooded with trees in the form of parasols. Here the euphorbia, with its strange candelabra-like shape, immediately excites the interest of travellers. The water-courses are bordered by narrow woodland fringes, dominated in places by palm trees, of light and elegant mien. The edges of the lake extend into marshes, which lie concealed under innumerable reeds.

"Among this quiet scenery, through which spread vast plains periodically devoured by bush-fires, large and small animals roam. Thousands of antelopes, buffaloes, elephants, lions, leopards, hyenas, jackals, wart-hogs and the whole retinue of savannah-frequenting animals, are found

in abundance and afford to the visitor, at every turn, surprising and unexpected sights. Immense troops of hippopotamus swim in the rivers, sleep on the shores and sand-banks and wallow in the warm mud of the marshes. Birds are numerous everywhere. Among them, on the borders of the lake, there is a colony composed mainly of water-fowl. Pelicans, ibis, egrets, spoon-bills, cormorants, to name only a few, congregate and pursue their ceaseless fishing in this sheet of water which is perhaps more full of fish than any other lake in Africa.

"Let us now turn to the southern side of the park and examine the solid mass of high mountains, built up entirely by volcanic activity. The calm lines and colours of the great flat plain of Lake Edward are abruptly succeeded by a broken landscape studded with formidable volcanoes, some still active, others scarcely extinct. Their outlines, here ample and rounded, there

tapering or sharply serrated, meet the eye in all directions under an often sombre and menacing sky. From certain volcanoes plumes of vapour rise, indicating an activity which at night, when the clouds reflect a red glow, can be perceived from a great distance. The majority of them possess gigantic craters, but one perceives, around the central cones, an infinity of secondary openings of all dimensions. These give the surrounding country the look of a lunar landscape, which even its heavy clothing of forest does not diminish; and from their gaping mouths, large and small, have spread many streams of lava, filling depressions, forming hills and valleys like the waves of an angry sea.

"The porous nature of the ground explains the scarcity of rivers and lakes. Rain-water falling on the lava reunites in subterranean streams, which ultimately find their way into Lake Edward or Lake Kivu through springs beneath the surface.



'From their gaping mouths . . . have spread many streams of lava.' Still soft, the molten mass flows slowly down, its surface 'like the waves of an angry sea'



Most of the volcanoes are heavily clothed with vegetation, rising zone upon zone from 5000 to 14,500 feet. In the lower thickets, among the moss-encumbered undergrowth, are found many traces of gorilla



Two of the forest-covered volcanoes, now extinct, seen from Mt. Sabinyo. The farther one, Muhavura, lies on the frontier between the Belgian Congo and Uganda and is surmounted, at a height of 13,500 feet, by a small lake

Above about 12,000 feet one ascends into a zone where the strangest growths luxuriate—giant heaths (Erica arborea) and groundsels (Senecio johnstoni) growing to the size of trees and impeding the climber's path



Higher still, giant lobelias, with their 'immensely tall, poker-like tops', are prominent in the display of alpine flora. Looking down, from the top of Muhavura, to the plain many thousand feet below





Giant lobelias and alpine vegetation on Mt. Sabiryo, in the Kivu highlands

"The climate is quite different from that of the northern region, which I have briefly described. The mountains, some of which reach a height of 13,000 or even 14,500 feet, at times attract heavy clouds that for weeks on end envelop their crests. Torrential rains, at certain seasons, fall day after day on the slopes and in the valleys. Hail-storms burst from time to time on the topmost summits, leaving them mantled in white. The passes of this mighty volcanic chain are visited by furious gales of wind, the successive gusts of which are heard from afar off as low rumblings. The heights are everywhere pervaded, during the greater part of the year, by floods of rain, fogs, and a cold which the penetrating humidity makes difficult to bear.

"The rapid changes of level, between about 5000 and 14,500 feet, produce an extremely varied vegetation, which rises zone by zone on the slopes of the volcanoes, ranging from tropical forest to alpine flowers. Here and there, the lower forest gives place to thickets of bamboo which are so continuous as to constitute a uniform growth. These slender bamboos, which one meets up to a height of 8000 to 10,000 feet, yield in their turn to a forest of trees similar in appearance to our old oaks. Their light foliage, through which the sun's rays filter, allows the development of underbrush, among which gigantic St John's wort, full of fragrance, mingles with enormous wild celery. The ground is covered even here with a carpet of flowers, many of which recall those of our own regions. But if one continues to ascend, one soon reaches a new zone, where the vegetation is so strange that one might be entering another world. Giant heaths, their stems as much as two or three feet in diameter, their branches covered with a multitude of flowerlets and encumbered with cushions of moss which strikingly affect their shape, stand out among immortelles, giant groundsel and lobelias. The latter have immensely tall, poker-like tops and

are decked with hundreds of little flowers, dull enough individually but brilliant in the mass. Last of all, immediately below the summits, one finds only grass and moss, clinging precariously to the stones.

"Such is the picture, painted feebly enough, of a vegetation whose aspect is a source of constantly renewed surprise.

"The plant life, in all its rich variety, is matched by a no less remarkable animal life. First to be noted, among the numerous kinds of ape that inhabit the forests of the volcanoes, is the famous gorilla which has excited so much interest of recent years. It belongs to a race which, up to the present, has been found in no other part of the world. Totalling only a few hundred in number, these curious animals are distributed in small family groups, making their nests on the ground and feeding on young bamboo shoots and celery leaves. Peaceable as long as they are not disturbed, the males, which grow to a height of seven feet and a weight sometimes exceeding 500 pounds, are possessed of colossal strength and become formidable adversaries when provoked. Rising then to their full height and beating their huge chests with powerful fists, they utter roars terrifying enough to daunt the bravest explorer.

"Among the large animals, I will also mention the buffalo and the elephant, which are found up to an altitude of 13,000 feet. Quantities of other creatures live in these districts; many of them are still little known, and one may be sure that their study will provide considerable scientific interest."

In its present fulfilment, the Albert National Park corresponds entirely with the views of its creator. Slowly, and in full conformity with the regulations protecting the rights of the natives, it has secured the evacuation of certain villages which existed within the park. Nature, left more and more to its own resources, presents every day a more unusual appearance to those who watch and seek. Nothing, in



A pigmy of the bamboo forests, in the lower volcanic zone of the Park—too limited in needs and means to destroy the balance of nature

fact, modifies a group of living organisms so much as the presence of man. By hunting and by breeding he destroys or disperses some species, and converts others to his own profit. To aid him in cultivating the soil he burns vast stretches of forest, but, apart from the useless destruction

wrought by fire, which often outruns its purpose both in extent and in intensity, other dangers soon appear and minimize the partial success of man's utilitarian proceedings.

The native, whose needs are limited and whose methods are primitive, has hunted and cultivated for centuries without causing overmuch damage to nature. But the European, as much by his rationalized cultivation of wide areas as by his tree-felling for fuel, has proved in these regions a most dangerous enemy of vegetable life.

The biological balance of tropical vegetation, more delicate than its apparent exuberance leads people generally to suppose, is beginning to break up rapidly; its disappearance would beget disaster. Animal life, always dependent upon its vegetable environment, is likewise subjected to destructive influences, and soon abandons places where it can find neither food nor normal surroundings. Driven into their last refuges, every year rarer and more restricted, the few remaining representatives of some vegetable and animal species were faced with extinction. The intervention of the Albert National Park has, within its own sphere, averted this peril. And now, both on the plains of Lake Edward and in the forests of the volcanic mountains, the most varied species breed abundantly, in natural conditions, without encountering any checks other than those imposed by nature. The antelope fears only the lion and the leopard; the elephant fears nothing. And man, hitherto an inspirer of fear or hatred, is now no more than an object of simple curiosity.

Man and Nature in Central Australia

by CECIL J. HACKETT

The attitude of our forefathers towards the native inhabitants of lands where they desired to settle is well expressed in the resolution quoted at the end of the present article: in but few countries can their treatment be recalled without shame. Here is a picture of a primitive people who, despite the difficulties of their environment, have achieved a balance with nature into which European intrusion introduces a fatal element of disturbance. If the present generation always approached backward races with as sympathetic an understanding as Dr Hackett, there would be no further danger of our failing to treat them with the respect due to our common humanity

In the north-west corner of South Australia is a large district, approximately 20,000 square miles in area, which comprises one-third of the Central Australian Aboriginal Reserve. Officially, no Europeans are allowed on this Reserve without permits from the States in which the area lies. Although few permits are granted, and those only to scientists, during the cooler months of the year a number of Europeans visit the Reserve in search of wild-dog scalps, for which the respective Governments pay from 7s. 6d. to £1 each in the hope of reducing a pest. The 1933 expedition of the Board for Anthropological Research of the University of Adelaide, of which I was a member, was sent to this part of the country.

From Adelaide the seven-hundred-mile journey to Oodnadatta was made by train. Here, where the rainfall is low and uncer-

tain, the final result of European occupation of a 'hard land' can be seen. The country appears a desolate waste, the result of uncontrolled overstocking and droughts. Here also can be seen the effect on a primitive race of contact with European ways and means: culture seems scarcely the word. A few shabbily clothed, miserable-looking natives are to be seen, who for the most part have drifted into the settlement from outlying districts, for the local Arabana tribe is now practically extinct. This extinction is the result, in Australia at any rate, of the construction of a railway line, by which infectious respiratory diseases, so deadly to isolated communities, are carried.

Leaving Oodnadatta on an afternoon towards the end of May, we arrived at Ernabella, after travelling over three hundred miles of unmade roads, at midnight the following day, having enjoyed three hours' sleep. Our hurry was due to the fact that we were travelling by the monthly Royal Mail and had taken it over a hundred miles past its usual terminus, whence it had to return to Oodnadatta to meet the down train a few days later. *En route* we had passed through several cattle stations, none very prosperous and some already abandoned, though not before serious harm had been done to the native fauna and flora.

Ernabella, which lies on the eastern side of the Musgrave Ranges, in Glen Ferdi-





Cecil Hackett

Adjoining the Central Australian Aboriginal Reserve is the 'station' of Ernabella, recently established in virgin country. The land here, though able to sustain nomadic native life, will not withstand concentrated stocking

land, is one of the latest batch of stations opened up in virgin country adjoining the Aboriginal Reserve. In May it is a delightful place, with pleasant days and cold nights, for it is over 1000 feet above sea-level. The station homestead was a primitive construction of boughs from the nearby trees. Already the drastic effects of concentrated stocking in this type of country were evident; for the camels had eaten off and trampled down much of the smaller vegetation and the wind had completed their work.

The morning after our arrival the aborigines showed considerable interest in us and watched our movements from nearby rocky points. We were amused to notice that when any strange sound was heard, such as that caused by a visiting camel-string, the natives would climb to some point of vantage to see what was hap-

pening. We were equally amused when a few weeks later we found ourselves automatically doing the same thing. The tribe to the east was the Jankundjadjara, that to the west the Pitkandjara. The former, already in contact with a sparse European population, showed a definite decrease in the number of children to the family.

It is impossible to imagine a bush aboriginal without a dog. Before the arrival of Europeans in Australia the dogs were pure-blooded dingoes, but now these are outnumbered in native camps by animals containing mixtures of many, if not of all, strains of larger European dog. The native is fond of his dogs although he does not devote much care to them. They assist him in the hunt, but afterwards must hunt for their own food. Heavy infestation with worms, carried by rabbits and other animals, keeps them in poor condition.

After a few days spent in packing and general organization, a string of sixteen camels was loaded and we set off into the west and the Reserve. Since camels were first imported into Australia, in 1860, by Sir Thomas Elder, they have played an essential part in exploration and the opening up of the arid areas. They are gradually being displaced by motor transport. At first the Afghans, who were brought over with the camels, were the only teamsters, but now many Europeans work camels. They are quaint and not unattractive animals, after one gets over the first shock of close contact with them. The sinuous track in the sandy soil left by a team of camels remains visible for years afterwards. Much of the early mapping in Central Australia was worked out from camel journeys, reckoning on a speed of two and a half miles per hour with a correction of

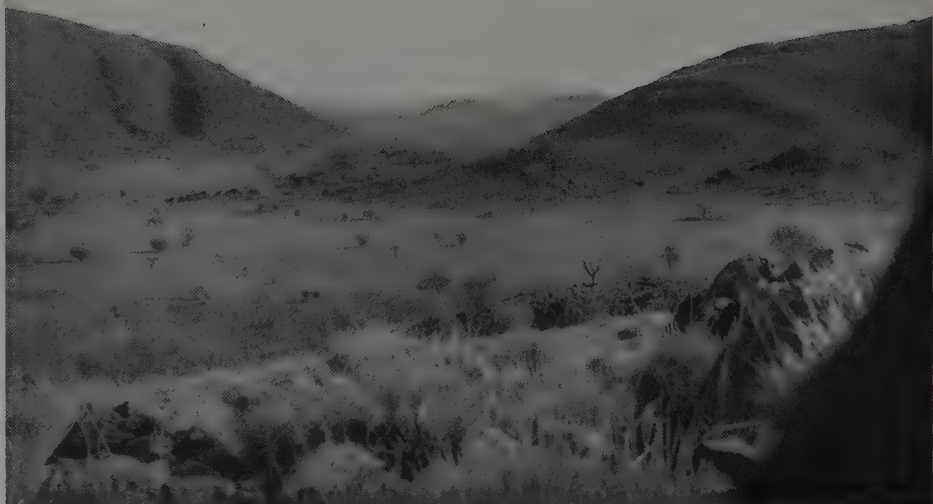
minus 6 to 8 per cent for deviations, which are due, one can easily believe, to the leader repeatedly looking behind to make quite sure he is not alone.

The party consisted of Mr N. B. Tindale of the South Australian Museum, myself, the owner of the camels, interpreters, a few young natives and three cattle-dogs. Passing along the southern side of the Ranges on the fourth day, we reached Konapundi. Here we found the last European who was hoping to buy dog scalps from natives of the Reserve when the pupping season began. We were fortunate to find an encampment of 250 natives. Families occupied the centre of it; unmarried men and men without their wives were on one side and unmarried girls on the other. They were gathered for the initiation of two youths and the ceremonies associated with it. By approaching the



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Aborigines near such a station, hearing any strange noise like that of an approaching camel team, will climb to a point of vantage in order to see what is going on



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The predominant vegetation of the area of the Aboriginal Reserve consists of mulga trees (Acacia aneura), porcupine grass (Triodia irritans), from which the natives prepare wax, and a few soft grasses



Cecil Hackett

Watering camels in a mulga grove. These animals were first introduced into Australia in 1860

old men quietly with due respect, we were allowed full facilities for close observation. For several days ceremonies, consisting for the most part of pantomime representations of the exploits of legendary heroes, were enacted. Finally, after a night of singing and dancing, the women and children were sent away and the lads were circumcised at midnight. On the previous days, when serious rites were performed, the women and children were also away from the camp. It is unfortunate that a locality as important in the lives of the natives as Konapundi is not included in the Reserve.

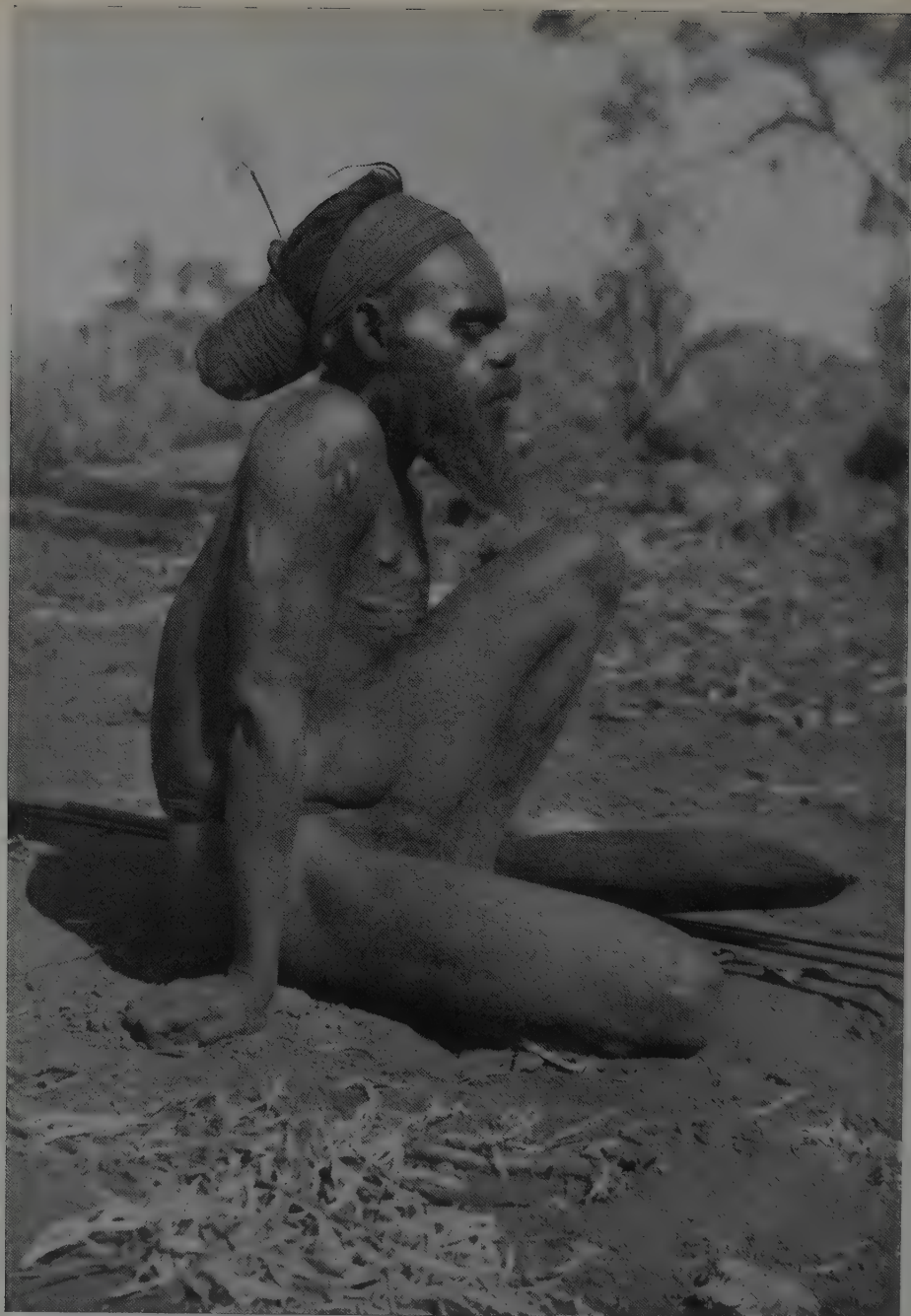
The next day's journey took us into the Reserve. It should be explained that a day's journey on camels varied from ten miles on short days to twenty miles on long days. On the Reserve we were able to observe natives leading lives as nearly approaching their original state as it is possible to see anywhere in Australia. They wander about from one water to another, wherever food is to be found, moving usually in small groups, which in summer, a trying time, may be limited to one family. Large groups do not, or cannot, remain together for any length of time as the game is killed off and scared away. Probably the population density is about one individual to fifty or more square miles. We found that no dead wood for fires was present within half a mile of many of the larger waters.

Native diet consists for the most part of mammals, lizards, birds and grubs. The advent of the rabbit and the less numerous wild descendants of the domesticated cat has added important items to the food supply. There is no general agreement about the total damage to vegetation done by rabbits; although there are periods when they are extremely numerous, it appears that epidemics then break out in the warrens and in two or three months few rabbits will be seen above ground. The cat, on the other hand, usually of the tabby variety, grows into a large animal

and is taking grave toll of the smaller marsupials. From all reports, both cats and rabbits are to be found all over Central Australia. The taking of big game, such as the kangaroos and emus of the flats, and the euros or hill kangaroos and wallabies of the ranges, is the occupation of the men, while small game, living underground, is left for the women to catch.

In this area of Central Australia the men were armed with a spear-thrower and one or two spears, while the women carried hardwood digging sticks, sharpened at each end by charring one side in fire, and one or more wooden vessels: deep ones (*mimbus*) for water-carrying and flat ones to assist in digging. The shafts of the spears are made from the long shoots of the tecoma bush, which are first straightened in hot ashes and tipped with a hardwood (*mulga*) point about a foot in length, often with one barb. These two parts are cemented together with wax prepared from the porcupine grass and bound tightly with wet-softened kangaroo tendon. The spear is about 8 feet long and $\frac{3}{4}$ to $\frac{7}{8}$ of an inch thick. Almost every time a spear is thrown it is necessary either to re-sharpen the point or to remount the head. The spear-thrower is a trough-shaped wooden implement about thirty inches in length, five to six inches across its widest part and less than a quarter of an inch thick. At one end is a barb which fits into a pit at the end of the spear, while at the other end is an expansion which forms the handle. This expansion consists of a mass of wax in which is embedded a flake of stone for use in sharpening the spear.

Often a native would also have a wooden rod, at one end of which would be mounted a similar piece of stone; with such a tool he would whittle a spear-thrower from a piece of wood taken from the side of a bough. Under good conditions game is soon taken. On one occasion a man returned from a small hill with a wallaby after an absence of only half an hour. At



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Aboriginal full-dress: head-band, bun, eagle-feather, hair-string belt, spear-thrower and spears



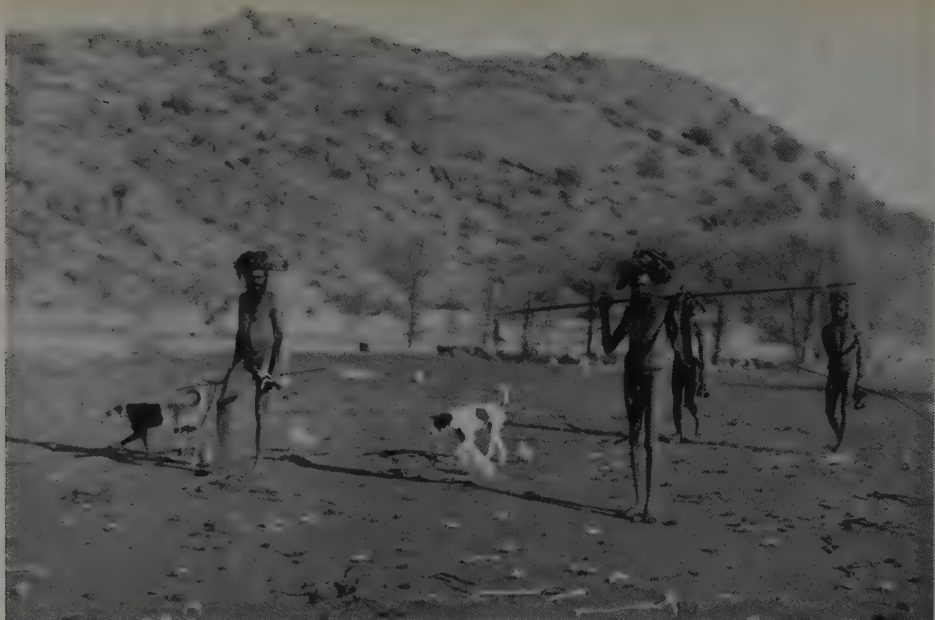
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A liberal use of red ochre tints the warm brown of the aboriginal's features, the dangles in his black beard and his head-band, which produces a much-admired highbrow effect



Cecil Hackett

Whittling a spear-thrower with a stone flake mounted in a wooden handle



Cecil Hackett

The aborigines depend on hunting for their food, for they grow no plants and have domesticated no animals save the dog—a constant companion. (Above) Bringing back a kangaroo, already cooked and quartered to facilitate transport. (Below) The day's bag—a dingo and two rabbits



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This euro or hill kangaroo (Macropus robustus) was one of several killed during a drive in the ranges. The small boys are carrying damaged spears so that the men may be unencumbered



The cat—imported, like the rabbit—has run wild in central Australia and grows to a large size. Usually of the tabby variety, it is now a favourite item of the nomad native's fare

By courtesy of the South Australian Museum

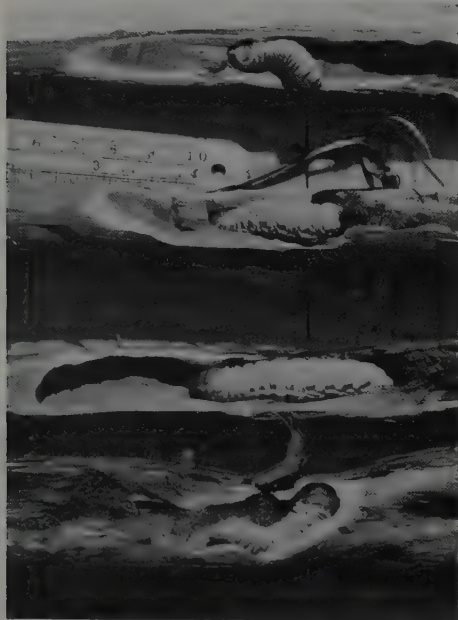
The aborigines' diet is supplemented with smaller creatures, such as lizards and grubs, caught by the women and children, who are skilful in extracting them from their hiding-places

Among these the grub found in the roots of the witchetty bush is regarded as a special delicacy. It is a large beetle larva, two inches or more in length, with a taste like that of pine nuts



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Ernabella several women would leave camp each morning and return towards the end of the afternoon with a dozen or more cooked rabbits each. The men are excellent trackers and hunters, as one might expect when their lives depend on their skill, for the aborigines have domesticated no animals, with the exception of the dingo, and grow no plants. In big hunts the kangaroos or euros are driven to some convenient spot where hidden spearmen wait. One evening we saw seven euros taken in this way. In taking solitary game, approach is made very cautiously while the animal is feeding, or, after rain, when kangaroos find poor foothold, an animal will be kept on the move until it is exhausted, care being taken to head its course so that the kill is near camp. An adult male kangaroo may weigh a hundred pounds or more; if the kill is some distance from camp it will be cooked, or what the natives regard as

such, and cut up so that each man carries his share.

The cooking of large animals is a man's job, carried out by lighting a fire in a trench dug to hold the animal. The fur is first singed off and the elbow- and knee-joints dislocated, then the carcass is placed in the hole and covered with hot earth and coals. The time it is thus left appears to depend on the appetites of those concerned. It may be as short as half an hour. This method of cooking 'in the jacket', so that the juices are retained and the meat protected by the skin, may be one reason why animal skins are not used for clothing during the cold season, for the natives are quite without body covering.

The women and children are skilful excavators of the witchetty grub, or *mako*

ilkoara as it is called. It is a large beetle larva of unknown species which lives in the roots of a particular mulga (*Acacia kempeana*). These trees, which usually grow in thickets, can be recognized from a distance by the whitish colour of their leaves. The women run to them, observe the direction of the roots, choose one in particular and expose it with their digging stick. By a tap they will see if a grub is present and then break the root across and extract the prize. It is rarely that the chosen root does not yield a grub. The larvae are two inches or more in length and their flavour, which lies in the skin, resembles that of pine nuts.

Apart from what they can carry in the hand or on the head, where heavy weights are borne with ease, the natives have no means of transporting their possessions.



Cecil Hackett

Evening at a camp in the Central Australian ranges, some 1000 feet above sea-level. Here, though close to the Tropic of Capricorn, the air is cold in the winter season, and the unclothed native cherishes the friendly fire

Water for man and dog is found either in rock-holes filled by the rain, where it soon evaporates, or in sandy beds that withhold it longer from the sun



Cecil Hackett

Small objects of ceremonial value are carried by the men in the buns of hair at the back of their heads. Other small things are placed in the hair or tucked under a belt of hair-string round the waist. Probably the lack of transport facilities is responsible for the absence of any great sense of property, apart from that for their few essential implements. This community spirit is carried into the sharing of food so that none go hungry.

The aborigines' day begins without breaking the fast. In the cold season, as it was when we were in their country, they spend the first few hours of light in warming themselves. For although they manage to keep small fires burning all night, before and behind them—hugging them so closely that they are scorched, the men down their fronts and the women down their backs (probably because a baby would lie before the mother)—in the morning they are still disinclined for activity. Burns from rolling onto the fires during sleep are

not infrequent. As the morning advances small groups form for general conversation and the planning of hunting parties, which then move off. If game is easily obtainable, camp may not be left until the afternoon. This also applies to the women if they are going for food. If water is to be fetched from a nearby rock-hole the women leave with their *mimbus* in the late afternoon. When they return there is a wave of activity as the one and only meal is then prepared and eaten. If there is more food than can be eaten at once, the remainder is placed in trees, out of reach of the dogs, and consumed later in the evening. When opportunity offers, an aboriginal man, woman or child can consume an enormous amount judged both by the size of the meal and the effect on the eater. It should not, however, be forgotten that such occasions are infrequent, and probably the average daily intake is less than that of many Europeans who are not stigmatized as gluttons.

Fires are always burning in the camps; while the natives are moving, even if it is only from one group in the camp to another, they always carry a fire-stick for warmth. On longer journeys they set fire to clumps of porcupine grass and pause to warm themselves in the earlier and later parts of the day. Two methods of making fire are common in this area; one is the well-known method of twirling a hardwood stick, held vertically against a piece of soft wood; the other is by drawing the edge of a spear-thrower across a similar piece of wood. The heat thus generated ignites some dry powdered grass which is then nursed into flame. The actual operation takes only a few minutes.

They showed considerable skill in the control of fire, making use of draughts to increase and of sand to diminish it. Dead trees that could not be pushed or pulled over were felled by setting a fire round the base. I can recall one cold night during which several trees crashed to the ground. A mother will often carry her youngest child across her loins, for mutual warmth; young girls, old women and occasionally men will similarly carry a dog. That there is need for this protection may be realized from the fact that it was only for a few hours in the middle of the day that we cared to remove any of our numerous woollies. Children were also carried on the shoulders or pick-a-back. This may continue through a long day's journey, and the duty usually falls to the mother.

It might truthfully be said that the children, especially the boys, are always spoiled by the women, and often by the men. There is deep affection between parents and children and husband and wife; on several occasions we witnessed demonstrations of grief by relations and friends for the dead. Children are fed at the breast for the first three years, after which they are completely on the diet of adults. They soon learn to classify the objects that they find as 'to be eaten' and 'to be discarded' and early supplement their

diet with grubs, small birds and lizards, berries, seeds, bulbs and roots. They join the women in food-gathering, but on the whole lead a happy life if seasons are not bad. The most popular boys' game is to throw pointed sticks at a disc of bark which is bowled past a line of boys; there is much fun and noise. Another game is played with spears made from the seed stems of the porcupine grass, pointed with the sharp ends of the leaves. These they hurl at each other, the victim making great efforts to dodge the weapon, which, should it reach his body, remains hanging by its point until picked off. The girls play swings on low hanging boughs or chase one another about with much mirth.

As the boy reaches puberty and takes to himself a spear and thrower, forsaking the



N. B. Tindale

Baling from a rock-hole with a mimbu—the deep wooden bowl used for carrying water



Cecil Hackett

Cecil Hackett



Though the adults are of spare build, babies are fat and never seem undernourished. The little girl who is sitting by the fire beside her baby sister has attached gum-buds to tufts of her hair by way of decoration

Women carrying mimbus on their heads and fire-sticks for warmth. The one on the left has her digging-stick (used, amongst other things, for detecting witchetty grubs); the one on the right shows a usual indulgence towards children, which has also some warming value



N. B. Tindale

(Above) The aborigines, in their natural condition, have never taken to the use of body-covering, even during the cold season. One reason may be that their method of cooking animals damages the skins. Other aids to keeping warm are thus all the more employed, and travelling natives light many temporary fires. (Below) Women returning in the evening from a water-hole

Cecil Hackett





Cecil Hackett

A popular boys' game is throwing—and dodging—'spears' of porcupine grass, which hang by their points if a hit is scored. They can just be seen in these boys' thighs

women and following the men in the hunt, he is marked for initiation. This means 'making boy young man'. He is then isolated from the main camp and avoids the women. During the next two or three years he undergoes two surgical operations and takes part in three groups of ceremonies, the last bringing him back into the camp as a young man. He does not become a 'big man' until he has grown a beard, and very proud he is of it when nature satisfies his wish. The 'surgeon' at one of the operations promises the lad a daughter for wife. She may be much his junior, so he must wait until she develops into womanhood. During this time he goes on a general tour of his tribal country and probably meets most of the members of the tribe. He joins in all ceremonies and learns the traditions, which are handed

down in songs. In due time he claims his wife and thus begins a new family life.

Casual observation of the tops of the women's heads may call forth strictures regarding their treatment by the men, for in almost all adult women the head is scarred and grooved. Such strictures would probably be unfounded, as a serious argument between two women will show. Any grave difference of opinion between women is adjusted by the two opponents striking alternate blows at each other. The opinion of the one who remains standing prevails, and tomorrow all is forgotten.

Everyone is related, in a group sense, as I learned when, to oblige a young lad, I became his grandfather. I found I was related to every native I met, had fathers, mothers, brothers, sisters—in fact all grades of relationship, including sons, daughters

and wives, in the group sense. When I realized that every woman who was of the correct group to marry my father was my mother, and the children of such women my brothers and sisters, these relationships could be understood. Any serious breach of tribal custom is punished by death.

Though we saw occasional bough and grass shelters, said to have been built during rainy periods, during three short wet spells none were constructed. As the rain continued, the natives gathered closer to large fires trying to keep themselves warm while the rain washed the dust off them and made their skins a lighter shade. In their natural bush condition they are not uncleanly. They are seen at their worst when clothed in the tattered discards of Europeans.

The term 'black fellow', although in general use, is not accurate: their skins are not black but a dark chocolate brown. The men are about five feet seven inches in height and of light build. Although their lower limbs, judged by European standards, would be considered thin, the trunk and upper limbs of young adult males have a symmetry and beauty such as that the Greek sculptors loved. They are not a hairy race and their head hair falls in waves. Their sight and hearing are acute. Although their noses are flat and broad their lips are not negroid, and they have shapely ears and delicate hands. Their foreheads slope backwards and their eyebrow ridges are prominent. Their teeth are remarkably fine. Their irides are a rich brown. Their voices are soft and, like their merry laughter, which is easily aroused, very attractive. They are fond of songs, and singing is the usual evening pastime when the inner man is satisfied.

There are several grades of songs or *inma*. Some are sung with and by the women; others may be sung in the hearing of women but not in their sight; while another group, the *inma bulka*, can only be

sung by and in the presence of initiated men. Our feelings were mixed when we heard a native, who would have no word of English, sing a verse of some hymn, taught by a missionary several years before. In some cases the lines were word-perfect, in others, though tune and rhythm were present, not a single word could be recognized. I have learned part of the song of the Kangaroo Man; I wonder if I shall qualify for a share in the last great kill! The names by which they know many birds are onomatopœic; for instance, the bell-bird is called *bun-bun-pull-la-la*, and the lark *chin-chilli-limpar*, which closely resemble their calls.

In considering the character of these tribes, I feel one should, above all, regard



N. B. Tindale

This small boy is holding a sand-dwelling mole (marsupial, with a pouch for its young, like many native Australian animals) which is rarely seen on the surface



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Ceremonies play a large part in aboriginal life, and in those connected with initiation the youths learn the tribal traditions, perpetuated in songs sung round the fire by the grown men

them as children. Their greatness lies in the balance which they have achieved with nature. They may at times be unwittingly cruel, but life shows not to them the kindness that it offers us. They are extremely co-operative, to the limit of their capacity, and more than that should not be expected of them. To the early explorers and settlers their service was essential and was freely given, in many cases to their ruin. The earliest history of the new closely settled European communities show the originally helpful character of the native race. In most instances where troubles with and murders by the natives occurred, abundant provocation had been given by the whites if not by the actual victim, and how shall one judge another in whose eyes a personal offence can be adjusted with any member of the offender's tribe? At a public meeting in Sydney, in

the early days of settlement, after a group of Europeans had been found guilty of the massacre of many natives, adults and children, and condemned to death, a resolution was passed expressing indignation with the Judge and Governor on the ground that, as the natives had no souls, to slay them was not murder!

In the history of other nations, those who withstand the power of the invader and maintain the honour and dignity of their people are regarded as heroes. The aboriginal who resents the white man's intrusion, and the taking of his land and women, is regarded as a rogue; he often dies as befits a hero. In our present state of knowledge the only thing that can save these people is to prevent all access of Europeans to them until more has been learnt from a study of the detribalized natives in the more settled areas.